# EXCAVATING ENGINEER

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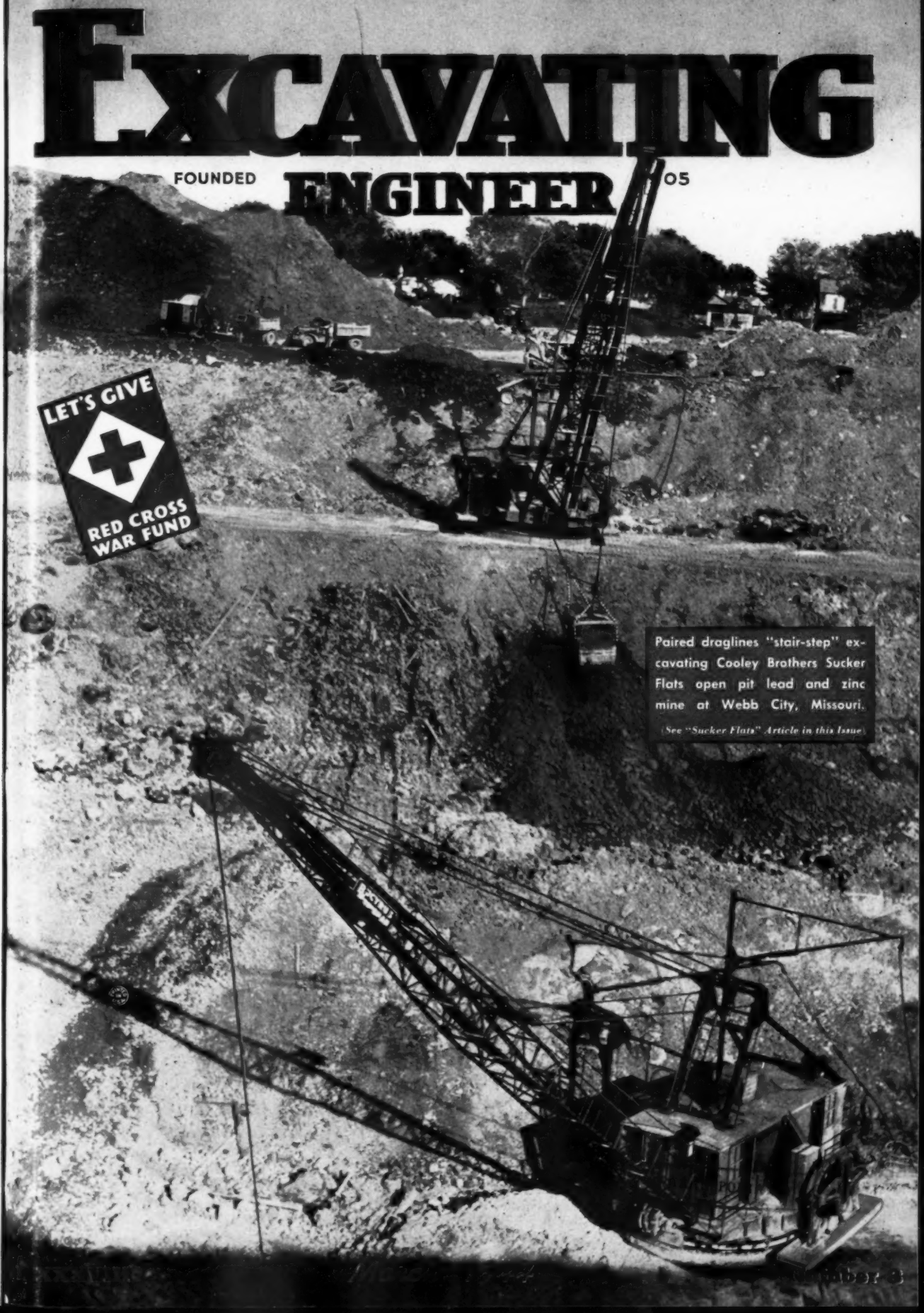


Paired draglines "stair-step" excavating Cooley Brothers Sucker Flats open pit lead and zinc mine at Webb City, Missouri.

*(See "Sucker Flats" Article in this Issue)*

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# BUCYRUS-MONIGHANS

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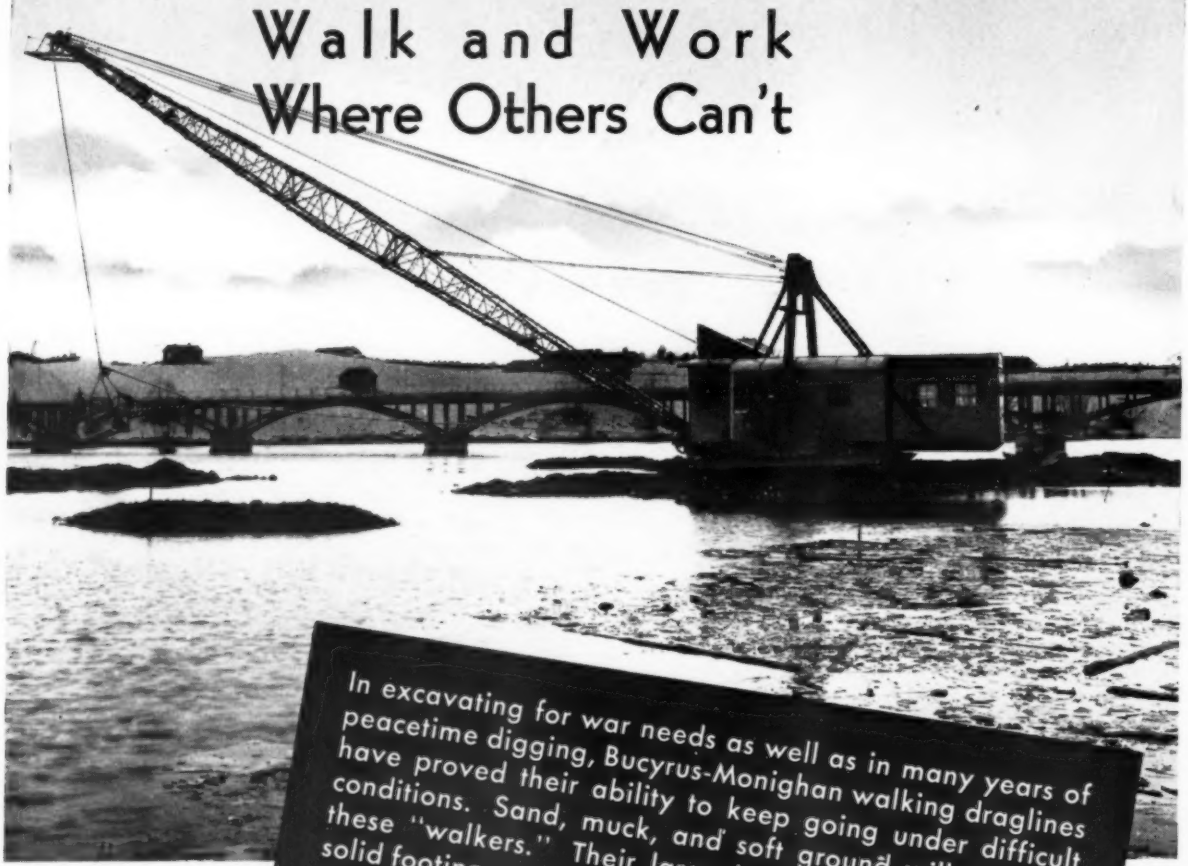

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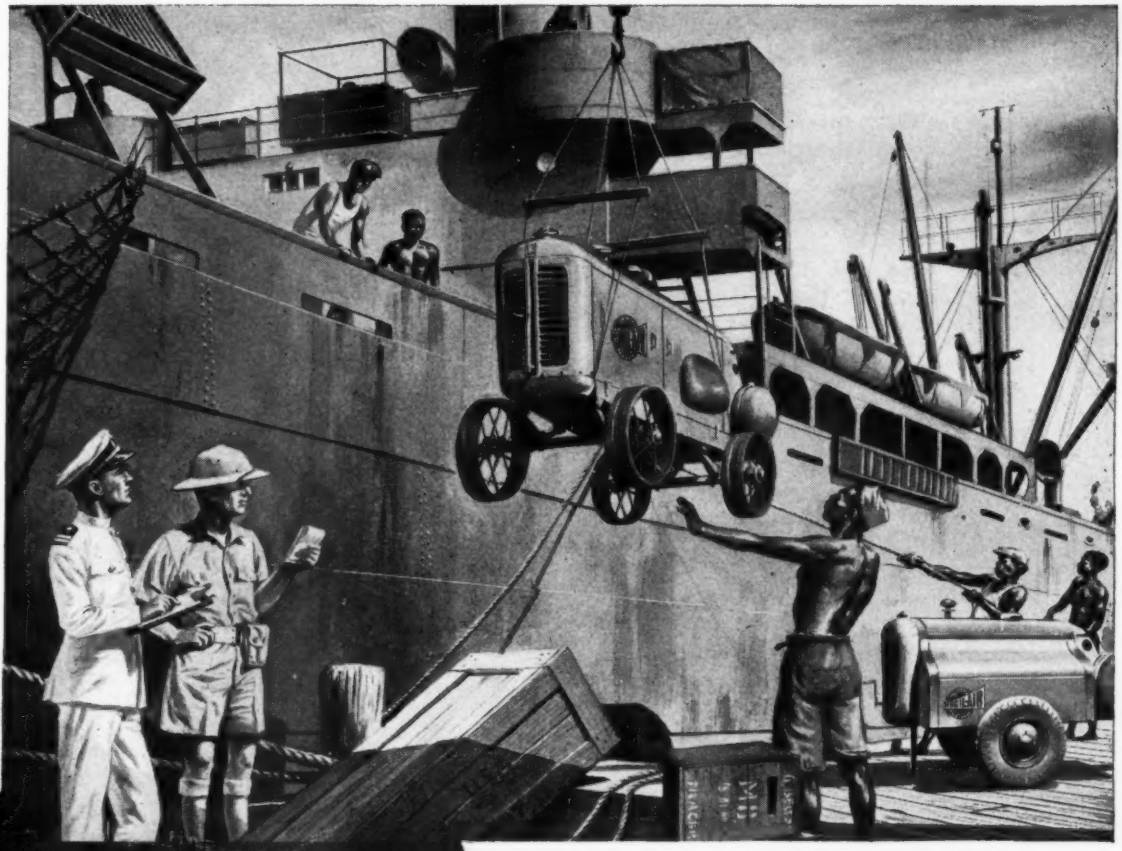

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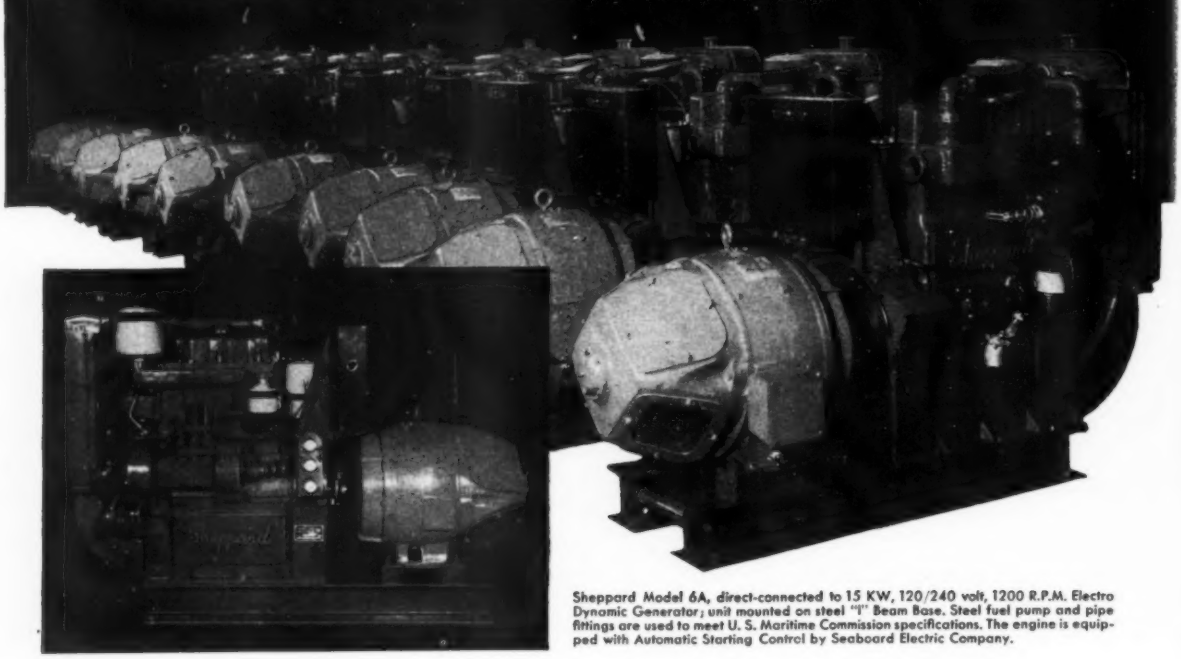

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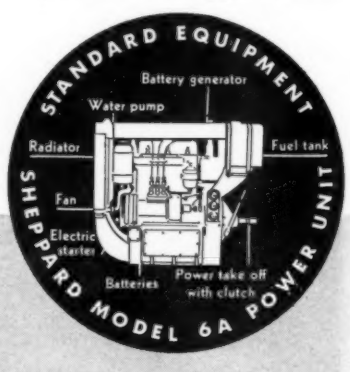

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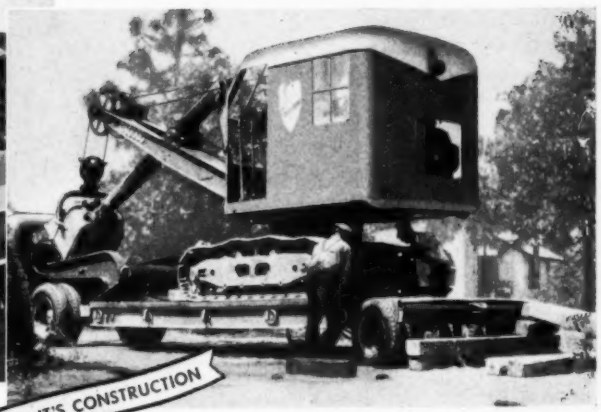


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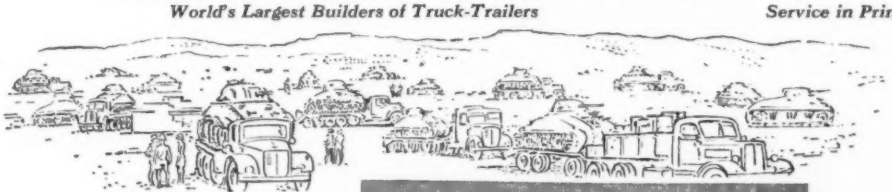

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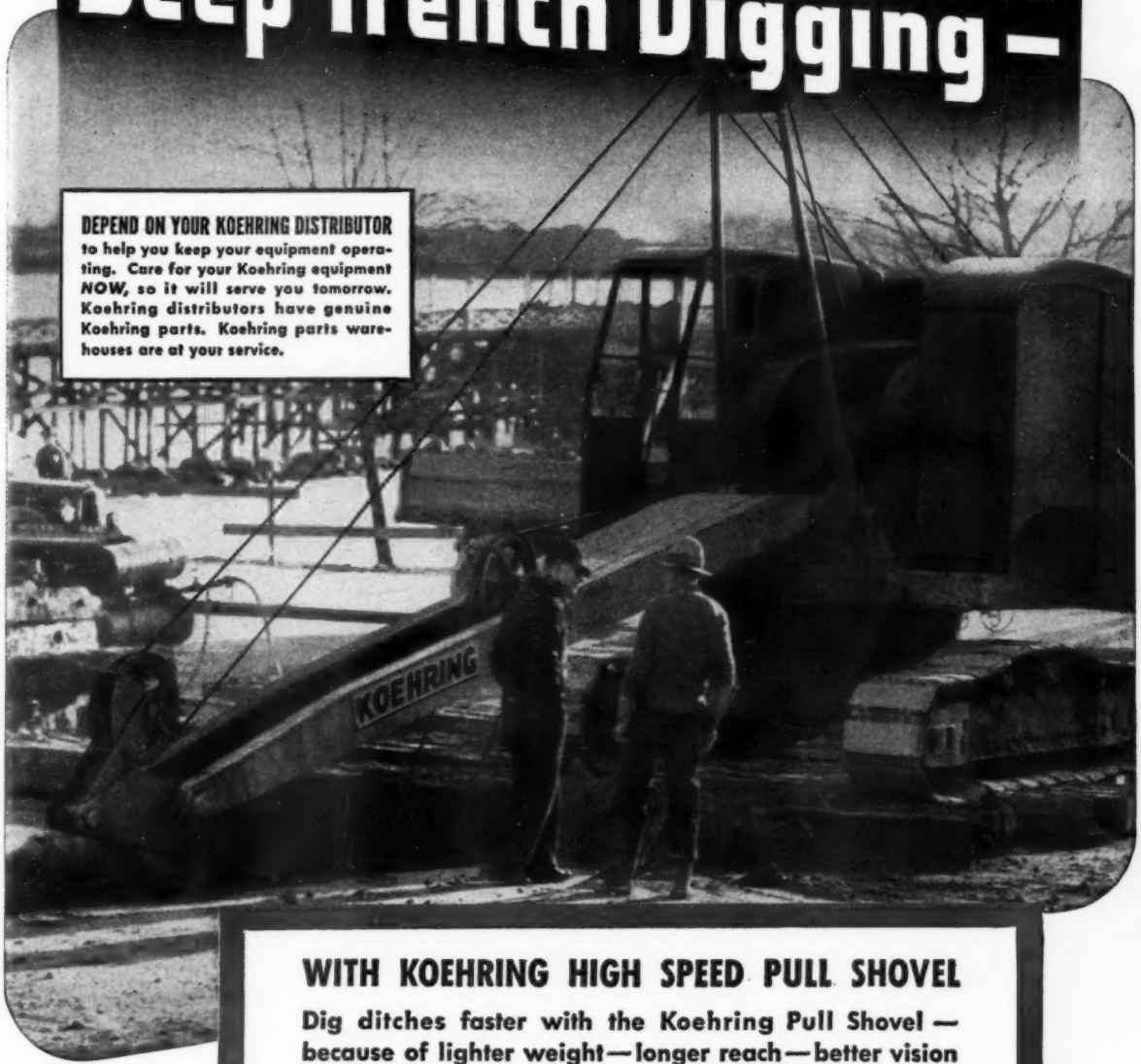


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# SUCKER FLATS

**Cooley Brothers use placer gold mining methods to open pit mine soft ground deposit of lead and zinc in Webb City, Missouri, by using their two Bucyrus-Monighan 3-W draglines to rehandle the material. Also adopt placer gold washing plant methods for unique mill on the site.**

● Cooley Brothers' two Bucyrus-Monighan 3-W electric draglines work in pairs on a "stair step" method of excavating at Sucker Flats. The lower machine excavates material 30 ft. below its level, at a 75-ft. radius, and deposits it 30 ft. above its level. The upper dragline, on the surface level at the time our staff photographer took this picture, rehandles the material and spoils it on the pile in the background.

By J. D. GRACE
Associate Editor

KNOWN locally for years as "Sucker Flats," the 40-acre soft ground deposit of lead and zinc in Webb City, Missouri, has proven to be "Succor Flats" to the Cooley Brothers.

Cooley Brothers at Como, Colorado, and Cooley Gravel Company at Townsend, Montana, were dredging alluvial gold deposits successfully at these respective locations when in October, 1942, the War Production Board issued its order that stopped gold mining. The one-week-notice order ended both businesses temporarily and left the companies suddenly confronted with the prospect of two idle organizations and no work for heavy excavating equipment.

When Sucker Flats, within the southern city limits of Webb City, Missouri, in the Tri-State lead and zinc mining field, was called to their attention, it was easy for the two brothers, C. G. and L. M. (Deac) Cooley, to visualize an adaptation of placer mining methods to this soft ground which had been tunnel-mined intermittently since the '80s. The nature of the ground, a combination of soapstone, selvege, shale, and broken flint, discouraged standard shaft mining practices. Time and again mining companies were organized for ventures on Sucker Flats and, although a few were moderately successful, the failure of the heaviest timbering to hold the soft ground encountered usually soon resulted in their insolvency. The high grade of the ore dirt, however, remained a temptation for further mining attempts.

Back in 1885 an organization called the Center Creek Mining Co. acquired about 100 acres of land within the southwestern limits of Webb City, and leased the land in lots, a city lot at a time. There was no charge for the lease but the lessee was required to pay the Center Creek Mining Company a 33⅓ per cent royalty and to sell to the company all ore mined at $2.00 a ton under the market price. The usual royalty paid in the Tri-State area is 10%. Many of the lessees would dig their shaft and drift out for three or four days to get enough ore to obtain money for a spree. After celebrating his success for a couple of days the miner would come back to find his drift caved in. He then either started over or gave up the mining business. Lack of adequate financing and their hurry to get as much pay ore out as quickly as possible many times resulted in careless and inadequate timbering. Several miners lost their lives in cave-ins. As the years passed it was necessary to go deeper for the ore and it then became harder to hold the ground from cave-ins. As time passed the price of ore decreased and the Center Creek Mining Company went out of business about 1910.

leaving behind a group of broken-down shafts and caved-in mines. Delinquent taxes piled up and from time to time the lots were sold for as low as $1.00 each on tax certificates. It was during the Center-Creek days that Sucker Flats got its name.

### World War I Period

From 1910 to 1940 the lots in Sucker Flats laid idle most of the time. Individual lots were sold and resold several times on tax certificates as the buyers failed to pay the taxes. During this time there were occasions when some lot-owner would pump the water out of a shaft on his lot and start mining for a while. During World War I the price of lead and zinc rose to $145 and $135 a ton, respectively. Old men, women, and children went out to Sucker Flats with wheelbarrows and coaster wagons and "scrapped" the dumps. After the surface was cleaned this scrapping would be discontinued until a rainfall would expose more ore on the outside of the piles. About this same time rich lead and zinc fields were discovered in Oklahoma, across the Missouri border line near Webb City, and the mills from the Webb City and Joplin area moved to the new Oklahoma fields, about 30 miles away. It then no longer paid to mine Sucker Flats. Homes were built on a portion of the 100-acre area originally owned by Center Creek Mining Co.

About six years ago, F. W. (Mike) Evans of Picher, Oklahoma, leased about seven of the town lots in Sucker Flats. He drilled test holes in the area now being mined by Cooley Brothers. The tests proved so rich that he didn't believe them himself when men brought him the samples. He went back to Sucker Flats and sat on the rig to see that other test holes were drilled properly, between the first test holes. Samples from these additional holes showed the same results, and the test of one hole was so rich that a competent mining engineer would not accept it to prepare his reference.

Evans then took out other leases and drilled a total of 39 holes. The samples were so unbelievably rich that Evans decided to see this ore in the ground with his own eyes. He sank a shaft through a solid limestone barrier next to the soft ground deposit and started to drift out at 141 feet. After cutting out about 20 feet in the limestone, the blasting near the soft ground cracked the rock formation and water poured into the drift and shaft. The water levelled off at 115 feet and so Evans came up and drifted off at that level. This drift is now being used for pumping water from the Cooley Brothers open pit mine. Evans hauled some of the ore he mined to his Waco, Kansas, mill and the results showed a good ore content. However, ore was only worth about $35 a ton at that time and so he did not continue this mining venture in Sucker Flats.

After watching operations in the Pittsburg, Kansas, coal fields Evans then got the idea that the property could be open pit mined. He talked to Harold Titus, Kansas City representative of the Bucyrus-Erie Company, about the stripping possibilities and Bucyrus-Erie experts estimated the equipment that would be needed and helped plan a method of operation. During this time Evans started buying town lots in Sucker Flats as the opportunity arose. He also took care of legal details necessary for the vacation of land originally deeded for alleys and streets in the Sucker Flats area. As an experiment, Evans then bought a Bucyrus-Erie ½-yard clamshell and sank a 70-foot shaft with the clam bucket without the use of cribbing. After 70 feet he tapered this shaft, cribbed it, and mined for a while with this clamshell. The wood cribbing was 6'x6' and was built on the surface in 10-foot sections and lowered into the shaft by the clamshell. Evans' clamshell mining operations were intended only as an experiment and not as a commercial venture, but they did demonstrate the good quality of the ore.

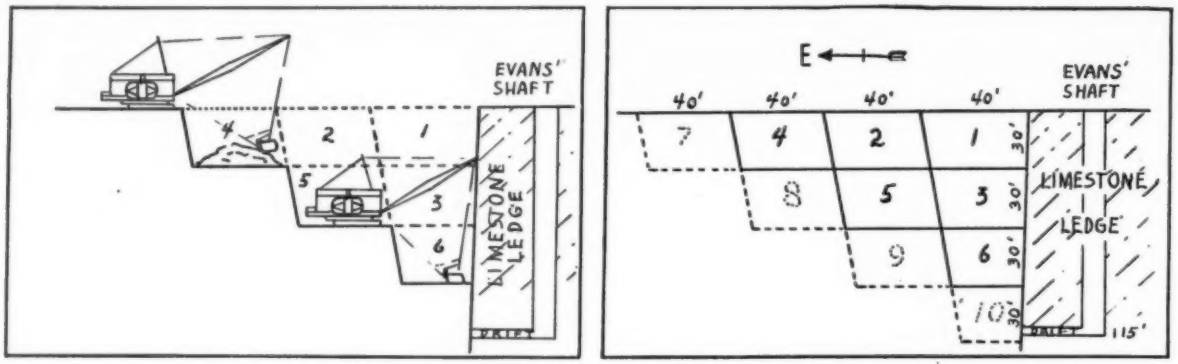
### Suggest Project to Cooley Bros.

When the mining of gold was so suddenly interrupted (to divert manpower and equipment wherever possible into more essential production) Bucyrus-Erie representatives suggested to Cooley Brothers that their gold mining equipment might logically be applied to the open pit mining of Evans' Sucker Flats property.

After Cooley Brothers became in-

● Limestone bank forming West boundary of pit. Water accumulated in the pit by natural drainage in the small area near the drift cut by Evans through the limestone bank 115 feet below the surface is drained through the drift and pumped up an eight-inch pipe through Evans' shaft and piped to a storage pond for use in the washer plant.

● Excavating from the fourth bank the lower Bucyrus-Monighan deposits ore-dirt on the second level from where it is rehandled by the upper dragline, located on first bank, to a spoil pile from where it is bulldozed farther back from the face of the first cut. The Caterpillar D-8 tractor and LeTourneau bulldozer at the lower right prepares the road for the draglines to walk to various bench levels.




● **Right: Method of making the sixth cut with the two draglines. Dirt dug from cut 6 is deposited on the bench of cut 4 and spoiled by the upper dragline spotted on the surface level near the face of cut 4. Stripping was started on cut 1 adjacent to the limestone bank on February 1. Material excavated was thrown upon the top of the stone bank and bulldozed back away from the face. Left: Pattern followed in "stair step" benching at Sucker Flats. The first six cuts have been completed and the next step arrangement is 7, 8, 9 and 10, bringing the pit to 120-foot depth, the maximum digging depth, with one rehandling, for the paired draglines.**

terested in Sucker Flats as an open pit lead and zinc mining venture, Evans bought additional lots in the area for overburden storage and a preparation plant site. The titles to these lots were very involved. In one case it was necessary to get 42 quit-claim deeds from the relatives of one of the former owners who had since died. Another lot had been mortgaged to a bank that had since gone out of business. When sufficient property had been acquired, Evans and the Cooleys entered into a royalty agreement. The Cooleys then bought an additional 16 acres which they use for sludge ponds.

When Cooley Brothers arrived on the scene they made additional churn drill tests which indicated the presence of high grade ore between the 115 and 145-foot levels. Tests indicated some ore mixed in the overburden at 60 feet and a good deal of low-grade ore between the 80 and 90-foot levels. Churn drilling in the area also disclosed a sheet-ground ore formation from the 160 to 185-foot levels. By using open pit methods in place of tunnel mining, all the ore in the pit could be obtained.

● **C. G. Cooley (left) co-owner of Cooley Brothers and F. W. (Mike) Evans, owner of Sucker Flats land. L. M. Cooley, other co-owner of Cooley Brothers, was on a business trip when our staff photographer took this picture.**

Study of Sucker Flats led Cooley Brothers to the conclusion that it would be more economical and practical, up to 145 feet from ground level, to use their two Bucyrus-Monighan 3-W electric-powered draglines with 80-foot booms* and re-handle the material in their stripping and mining operations, than it would be to haul material from the pit. It is proposed to use quarry methods below the 145-foot level. Sucker Flats are within the city limits and the city lots, into which this and the adjacent area is divided, are relatively expensive. A ramp to provide a maximum six per cent incline for efficient hauling would have to be about 2000 feet long. This not only would necessitate the purchase of additional property adjacent to the pit, but would also require the wrecking of improvements on this additional property. Tramp rock and limestone pinnacles would require blasting to make a ramp and road. It was decided that building a ramp and hauling road would be more expensive than the rehandling method of mining.

### Use Stair-Step Benching

Since each of their two draglines could excavate material 30 feet below the level of its own base and deposit this material 30 feet above its own base, and at a radius of 75 feet, a system of "stair step" benches were surveyed for excavation. The maximum digging depth with one rehandling for the paired draglines is 120 feet. From 120 feet to 145 feet it is planned to continue down with the draglines and rehandle with scrapers material from the upper dragline for the final 25 feet and haul it to stock piles. They are planning to use hauling equipment to mine out the sheetground to the 160-foot level.

Cooley Brothers moved one of their Bucyrus-Monighan walking draglines to Sucker Flats from Como, Colorado, on February 1, 1943. Also shipped from Como at the same time were a Caterpillar D-8 tractor, LeTourneau bulldozer with 11-foot blade and a LeTourneau 14-yd. Carryall. Duplicate equipment, except for the Carryall, was shipped later from the other Cooley Brothers' gold mining operation at Townsend, Montana. Five Bucyrus-Erie Red Arch buckets ranging in size from 2½ to 3½-cu. yds. are used on these draglines. The selection of the size and type of bucket used is dependent upon the character of the digging. One 2½-yd. AY heavy duty; one 3-yd. AY heavy duty; one 3-yd. AX medium duty, and two 3½-yd. AX medium buckets are used interchangeably on the two 3-Ws. When not being used the buckets are kept in repair by building up teeth, riveted sections of side plates, heel plates, and runner bars with Lincoln 3/16-inch Abrasoweld in the company's own repair shop on the site. After 60 to 75 days of use a bucket is again built up with Abrasoweld. Over a ton of Abrasoweld is used on these five buckets each year.

Using one of the Bucyrus-Monighans, Cooley Brothers started on February 1 to strip overburden just

*Manufacturer's information on the size of these draglines gives the following facts about them: They each weigh approximately 210,000 pounds, including bucket and ballast; have an outside base diameter of 17 feet, 227 sq. ft. of base area in contact with the ground (providing a pressure of only 6.5 pounds per sq. in.) and 3' x 16' shoes with 96 sq. ft. area per pair. The machines are 24 ft. wide across the shoes and the A-frame height is 25½ ft.

east of, and adjacent to the limestone bank into which Evans had blasted his shaft. All cuts were approximately 40 feet wide and 30 feet deep (see drawing on page 0). When the benching program started, much of the material was thrown upon the limestone ledge by the 3-W from where it was bulldozed back away from the face. Since the operating radius of the 3-W is limited to about 75 feet when the boom is set to provide a digging depth of 30 feet and a dumping height of 30 feet, it soon became necessary to spoil the material east of the cuts instead of on top of the limestone. This material was then bulldozed farther east to spoil areas.

When the sixth cut was started, the second 3-W was introduced to rehandle the spoil from the first machine. This tandem method was, of course, followed as additional cuts were made.

The second Bucyrus-Monighan dragline was put to work rehandling the material at Sucker Flats about a month after the first one started work. The company's Carryall was used when it became necessary to move the dozed dirt farther back from the edges of the pit than was economical for the dozers. This scraper hauled overburden up to 1,000 feet.

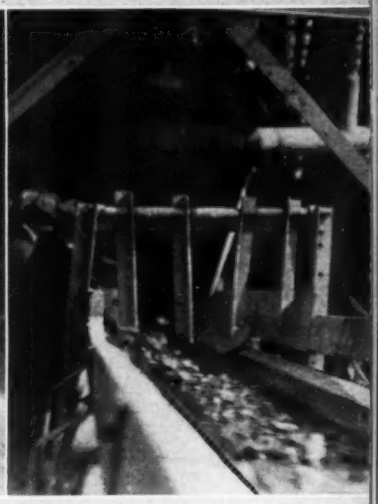
Investigation by mining engineers and stripping experts indicated that the combination soapstone and selvege, comprising the overburden, would stand at an angle of 50°, although the natural angle of repose of the spoil piles is a few degrees less. The only blasting necessary was the occasional loosening of rocky formations and one 30'x50'x150' limestone ledge encountered in the digging. Ingersoll-Rand jackhammers were used to drill 12-foot blast holes and Atlas and Gold Medal explosives were used for the loosening blasts. Boulders too large to handle in the dragline buckets were rolled aside and from time to time these were broken up by blasting to facilitate handling. Jackhammers were also used in making holes for blasting these boulders.

### Average Production

When stripping operations were started by Cooley Brothers with the one Bucyrus-Monighan, only one daylight shift was worked. Later, when the second dragline was put on the job and the preparation plant was completed to handle the ore, the two draglines were worked on three eight-hour shifts each. A 24-hour daily average of about 2,000 cubic yards of overburden and ore were handled and rehandled by the team of draglines

*(Continued on page 148)*

● **Left: ⅛-cu. yd. dipper of a Bucyrus-Erie 10-B digs into a stock pile of ore-dirt which is hauled a half-mile by truck to the mill. Right: One of three International trucks dumping a 4½ to 5-ton load of ore-dirt into a 12' x 12' hopper from a ramp with an elevation of 16 feet.**



● **Left: Looking down into the 20-foot long steel trommel screen of five-foot diameter. Ore-dirt just dumped into the hopper is washed into the trommel screen. The two iron bars across the face of the screen control the flow of material. Right: Plus 9/16" being carried on a 30" belt conveyor 60 feet long off the end of the stacker for future re-treatment.**

● **Left: De-watered 9/16" and under material is carried in a center bucket elevator to this four-cell steel plunger-type rougher jig (Cooley Type). Right: Carl K. Carmean, mining engineer in charge of the construction and operation of the ore washing plant and the development of the ore body at Sucker Flats.**

# Meet Uncle Sam's "Can Do" Boys

**Construction Battalions, newest unit of U. S. Navy are trained to build and to fight and although they are short on history, they are long on accomplishment.**

A NEW BREED OF Navy fighting man was born when the Japs attacked Pearl Harbor and captured Guam, Wake and Cavite, thereby proving that defenseless civilian workers were not the answer for the construction of the Navy's all-important advance base facilities. With every advance base a potential combat area, and each future beach head a construction site that must be constantly guarded against surprise attack, it became obvious that only naval personnel under military command could handle the job.

The Navy's solution to the problem was the organization of tough, seagoing, construction battalions which have been busy with their man-sized job of building springboards for America's global offensive. More widely known as the Seabees, a name derived from the phonetic pronunciation of the C.B. abbreviation of Construction Battalions, the newest unit of Uncle Sam's Navy is equipped and trained to build as well as to fight. Mechanics, carpenters, electricians, shovel operators, crane operators, pipe fitters, steel workers, pipe layers, wharf builders, welders, riggers, divers, draftsmen, surveyors and many other construction workers make up the enlisted personnel.

Seabee officers are trained by the Navy's Civil Engineer Corps and must know their business. A college engineering degree or its equivalent in practical experience is a prime requisite. Typical officers include graduates of leading technical universities and colleges from coast to coast; men who have been instructors, civil engineers, construction engineers, subway and tunnel engineers, contractors, and construction superintendents.

### Short on History

Long on accomplishments but short on history, the Seabees are building traditions that will give future members of this service something at which to shoot. Toward the close of World War I, a construction battalion was formed at the Great Lakes Naval Training Station, but it never saw service, and its personnel was merely assigned from the regular Navy. The nucleus of the present service started in October, 1941, when one company of 99 men was formed by the Navy's Bureau of Yards and Docks for utilization as an administrative unit by the Navy officer in charge of construction work being done by contractors with civilian labor. Two months later, five additional companies were formed for the same purpose and plans were made to increase this construction administration unit to three battalions made up of 3,300 officers and men.

The Japanese attack on Pearl Harbor changed all that. The Seabees would have to build, not just supervise; and they would have to be capable of defending what they built. First, the number of authorized regiments was raised to six, or a total of 20,000 men, then the figure was increased to 60,000. The present Seabee enlistment goal of 210,000 is far more than double the size of the entire peace-time Navy.

It takes Uncle Sam just 12 weeks to transform construction tradesmen into disciplined Seabee battalions. At special training camps among the dunes, swamps and scrub-laden wastes bordering the ocean shores of Virginia and Rhode Island, former tractor and shovel operators, carpenters, draftsmen, drillers, electricians, mechanics and many others are trained in military tactics and become familiar with the specialized equipment they will use in performing their major task of establishing advance bases for the Navy.

### Training Centers

Camp Peary, Magruder, Virginia, is the main Naval Construction Training Center for the Seabees. Camp Endicott, another training center, is located at Davisville, Rhode Island. The sites for these camps were chosen because of the varied terrain available for training purposes. Sand dunes, beaches, swamps, lakes, wooded uplands, lowlands covered with scrub-brush and just plain level fields are utilized to give the "boot" Seabees some taste of what they may encounter when they land on foreign shores.

Of the 12 weeks' training period,

● **Husky Seabees haul a water pump through dense jungle on an advance base. Water pumps are first used in building a base, later as fire-fighting equipment in case of an air raid.**

***All photographs used to illustrate this article are official U. S. Navy photos.***

# The Seabee Insignia

● Official insignia of the Seabees is this fighting-mad bee carrying a spitting Tommy gun, a wrench, and a hammer. His sleeves bear the naval rating badges of gunner's mate, machinist's mate, and carpenter's mate as well as the insignia of the Navy's Civil Engineering Corps. Designed by Walt Disney, the emblem neatly depicts the dual job being done by Uncle Sam's fighting construction men.

● Rigged as a pile-driver, a Bucyrus-Erie 15-B puts in palm tree piles for a landing dock at Florida Island. The Seabees appear right at home on this familiar task.

● Seabees are thoroughly trained in landing tactics. Within a few days they'll turn this former enemy stronghold into an attacking base for American ships and planes.

● Caterpillar tractors and LeTourneau graders grind out patterns in the stubborn soil of Adak as Seabees construct bases on Alaskan strong points to strengthen and extend Uncle Sam's Northwest sea frontier.

● Above: Somewhere in the South Pacific is the locale for this view of a Bucyrus-Erie cable-controlled Bullgrader cutting a military road through the shoulder of a hill. Below: The Northwest (left) and Bay City cranes are being used as pile drivers in construction of a dock so that shallow draft Navy supply boats can land material on Guadalcanal. The Allis-Chalmers tractor and Baker bulldozer is being used to prepare the approach.

● Below: The Seabees use two Allis-Chalmers tractors, one equipped with a Baker bulldozer and the other with a Bucyrus-Erie four-wheel scraper to prepare a landing dock on a South Pacific Island. Bucyrus-Erie clamshell can be seen at work in background.

the first four weeks are devoted to military training and during this period Seabee "boots" are taught to drill, salute, shoot rifles, pistols and machine guns and use hand grenades and bayonets. Just to make sure that the Seabee sting will be as potent as possible, Marine Corps drillmasters are assigned to teach and supervise the combat and weapons classes. From reveille at 6 a.m. to taps at 9:30 p.m. a typical Seabee training schedule carries the following activities: close order drill, articles for government of Navy, military courtesy, manual-of-arms, combat signals, rifle marksmanship, bayonets, extended order drill, 45-calibre pistol, hand grenades, chemical warfare, Thompson sub-machine gun, base layout and air-raid protection.

During the next eight weeks the men are familiarized with advanced base equipment and other problems pertaining to their specialized duties. Outstanding men in each battalion, chosen for their previous construction experience and adaptability to the Seabee training routine, are assigned to specialist classes of instruction for more intensive technical study. These classes cover such subjects as: boilers and heating, diesel and gas engines, dynamiting, evaporators and purifiers, generators and electrification, air-raid protection and camouflage, pontoons, propulsion units, dry refrigeration, welding, small arms, concrete forms and carpentry, diving, excavation and earthmoving, hut erection and fire fighting.

### Living Conditions

Seabee training camps duplicate actual living conditions at an advance base as much as possible. Quarters are in Quonset huts nestling under trees for concealment from the air. Only 10 men are normally assigned to each of these dome-shaped structures, giving the Seabees more commodious quarters than any other branch of the armed services. Galley equipment and hospital facilities are also about the same as those being used abroad.

Battalions are trained as building and fighting teams. Officers and men are permanently assigned to their respective battalion jobs during the last eight weeks and the group goes overseas as a complete unit. Each battalion is led by a lieutenant commander assisted by a lieutenant who ranks as executive officer. Each construction company (there are four companies to a battalion) is headed by a lieutenant, while an ensign is in charge of the single headquarters company. There is also a junior lieutenant for each construction com-

pany. Four ensigns and five warrant officers bring to 20 the complement of civil engineer officers. Two doctors, one dentist and two supply corps officers increase to 25 the total of commissioned officers in a battalion.

The total of 59 different trades represented in every battalion are distributed among the six specialist platoons in each company. One of the platoons is assigned to maintenance, two to general construction, one to waterfront construction, one to pipe and tank work, and one to electrical and mechanical service.

With training days behind and a tough job on some strange shore ahead of them, the Seabee battalions ship out, one or two at a time, for the far-flung battlefronts of this global war. Their destination may be India or Ireland, the Aleutians or Australia. Perhaps some island in the Caribbean or Pacific will be their home for months to come.

### Seabees in Action

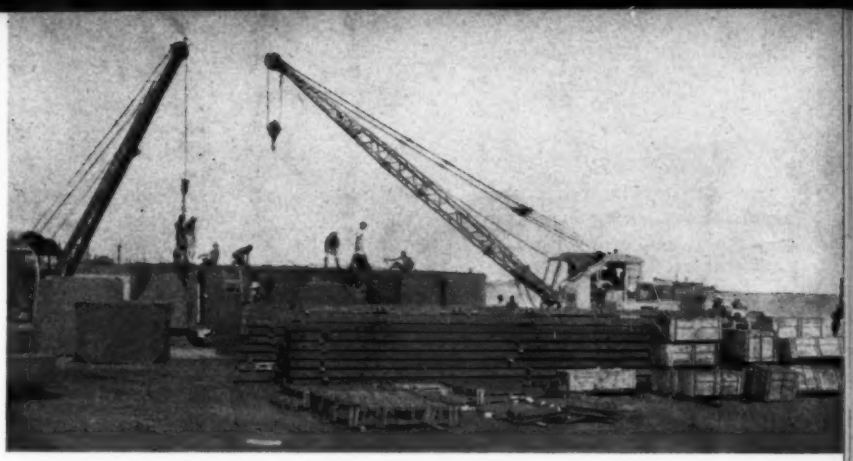
Let's follow a typical Seabee battalion into action as it establishes an advance base on island "X", an important South Pacific outpost. Right on the heels of the Marines, landed on the island by the Navy to establish a beach head, are the Seabees. Ready and equipped to assist the Marines in the scrap should the need arise, the Seabees' primary objective is to construct an airport quickly. Construction equipment planned for this job is put ashore to the accompaniment of Marine gun fire wiping out the last spots of enemy resistance.

Power shovels and bulldozers move into the tropical jungle and dirt begins to fly on the new airport site as the staccato beat of roaring gasoline and diesel engines replaces the noise of battle. Barracks and administration buildings are erected hastily. Camouflaged hangars are built and a machine shop is set up. Upon completion of the airfield grade, skilled hands lay down steel mesh runways. Anti-aircraft gun emplacements and machine gun nests are installed in a perimeter of defense around the airfield.

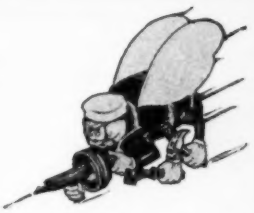
Ten days after the first Seabee landing barge put ashore at island "X", American bombers and fighters are taking off from this new field on Jap hunting excursions. Another potential danger spot that might have been put to enemy use is turned into a military asset for the Allies.

In this hard hitting global war, governed as it is by the length and strength of supply lines, the planes and ships with bases at their disposal are the ones that count. Bases, both

*(Continued on page 156)*

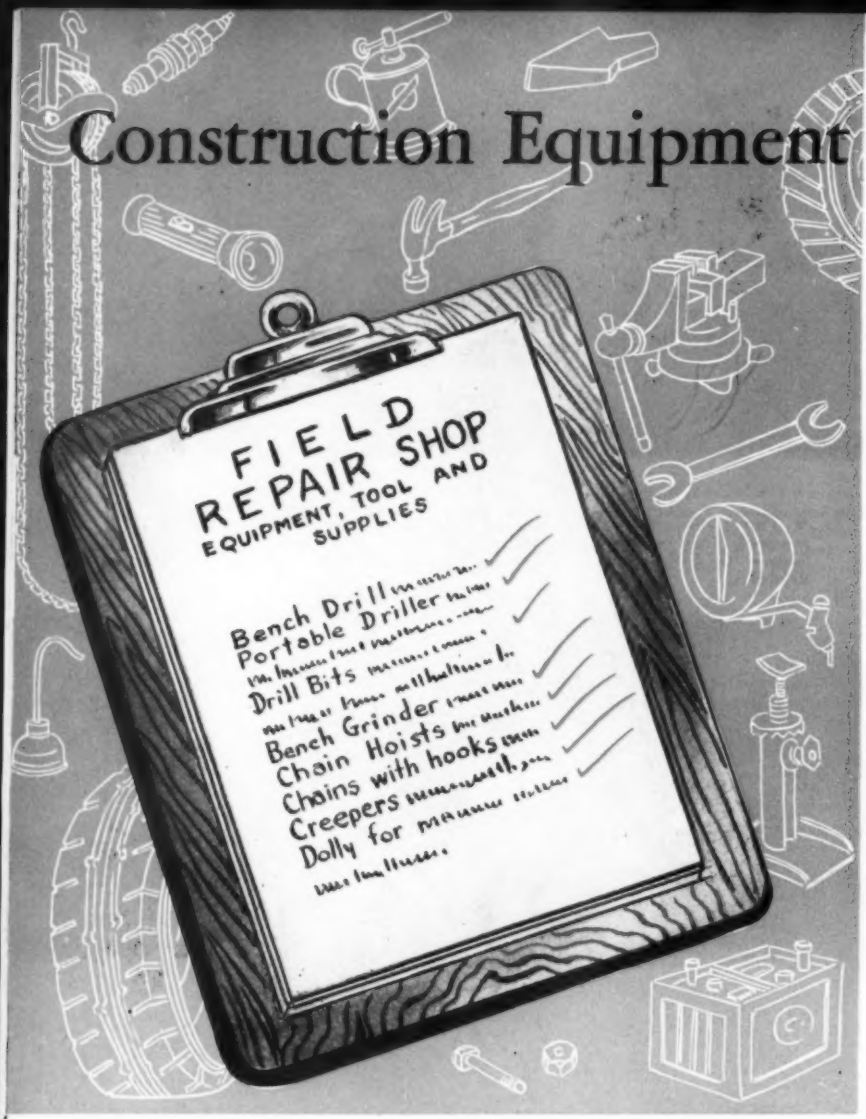


● **Two transit cranes assist in the assembly of steel pontoons. These versatile pontoon units are used by the Seabees to build landing barges, piers, bridges, and drydocks.**



● **Above: Well planned, sturdy piers facilitate the unloading of supplies at advance bases. Here, a clamshell is used by the Seabees in the construction of a palisade pier. Below: Speed and efficiency in establishing fighter strips are essential to our far flung Naval activities. Moving dirt in a hurry is an old story for this 1½-cu. yd. shovel at work cutting down a hill on a Southwest Pacific island.**

# Construction Equipment Breakdowns




## Check List of Parts, Tools and Supplies for Field Repairs

By LT. WILLIAM H. SANDS, U.S.N.R.

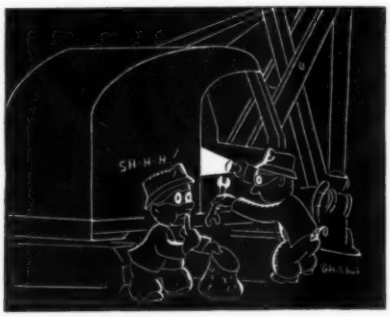
*Editor's Note:* The opinions contained herein are the private ones of the writer and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

A CONSTRUCTION job that starts "at the grass roots," where the contractor is required to purchase or rent everything from the first pencil to the flag that flies on "commissioning day" is not uncommon. It is difficult even for the most experienced to anticipate the multitude of needs that develop from day to day in such a situation. Consequently, the problem of procurement generally boils down to that state of chronic crisis expressed by the slogan "we need it yesterday." This is a peculiarly troublesome situation in the field of equipment maintenance and repair. It seems that the larger and more important a piece of equipment, the more prone it is to lie idle for want of the tiny and unobtainable "connippling pin."

The problem is most acute for those who must assemble equipment for operations overseas, but, as war shortages and dislocations have developed every equipment man is finding it necessary to foresee his needs for at least three to six months. It may be said that accurate diagnosis of future requirements is the only way to avoid work stoppage and the accumulation of an inventory of parts that are not needed.

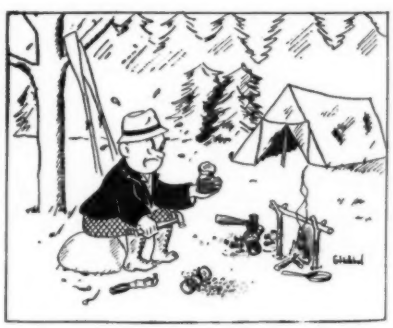
### Be Addicted to Cannibalism

An elementary precaution is to insist to the point of crankiness on getting the best equipment available and to an even greater extent on having as much of it as possible of identical models. Be addicted to cannibalism and cheerfully strip any machine to keep two others operating. A recent excavation project had 20 closely related models among its complement of power shovels. Nineteen of them worked faithfully through a notably bad winter. One arrived in need of rebuilding and was parked in a prominent location. Every day for seven months mechanics labored to put it into operation and every day the contractor's purchasing department ordered or expedited parts for this machine. The day shift claimed the night shifts robbed more parts from the shovel than could be installed in eight hours and the superintendent raved. When it finally went into operation a horrified government auditor discovered that the parts bill amounted to more than twice the original cost of the shovel. This was cannibalism at its best and a five percent "breakdown" average is a worthy aim.




*Night Shift Robbed Parts*

It would, of course, be preferable to anticipate one's needs and to have on hand all the tools, parts and supplies that might be normally required. This, however, is a difficult problem; one's situation is similar to that of a camper who goes into the woods and



*Forgets the Can Opener*

must "make out" with what he takes. His solution is generally based on using what he took last time plus the things he recalls having forgotten on that trip—like the can opener. One New York outfitting house met the problem by publishing a booklet listing all the gear that one would need on any expedition from a safari to a one-day tour of a trout stream. It proved invaluable to those preparing for their annual jaunt to the woods. It is possible that a somewhat similar list may be of value to those who have to anticipate breakdowns in construction equipment.

### Basis for Lists

The first factor to determine in compiling a list of this sort is the quantity and type of equipment to be serviced. The following lists of parts are based on these units: One power shovel, two motor patrol graders, four large bulldozers, and ten trucks. These are not submitted as a typical or balanced group of machinery, but as convenient units for the several types of equipment. Quantities of tools, parts and supplies will, of course, vary with the number, types, and condition of equipment and generalized lists are helpful only insofar as they may suggest things that will be needed. It is assumed that the period of time involved is one year and that enough machinery will be assembled to require a relatively complete field repair shop. The lists are broken down into shop equipage and parts lists. These lists may be out of balance or incomplete for use by all contractors, but they should prove to be a basis for an adequate list if revised to meet specific conditions. They are based on equipment and job conditions within the recent experience of the author.

## FIELD REPAIR SHOP

### EQUIPMENT

Bench Drill (extra chuck for same).
Portable Drills—heavy and light (extra chucks for same).
Drill bits (assorted high speed).
Bench grinder, double head with an assortment of wheels and wire brushes.
Chain Hoists, three ton and five ton.
Chains with hooks, shackles, and repair links.
Creepers.
Dolly for moving engines—the carriage of a portable welder may be used.

JACKS:

Four-wheel roller jack,
Five-ton hydraulic or mechanical jacks,
Ten-ton hydraulic jacks,
Twenty-five ton mechanical jacks.

Vises, several of the 6" jaw size and one heavy chipping vise with 8½" jaw.
Warehouse trucks.
Grease guns (hand), with adaptors, extensions, etc.
Electric or pneumatic grease guns with extra hoses and heads.
Transmission greaser.

### TOOLS

WRENCHES:

A complete "mechanic's set" of wrenches for each man. Extra end and socket wrenches and "Stillsons" will be needed as replacements and for the use of helpers, greasers, et al. An oversize socket set with ratchet will be required for use on heavy equipment and is needed occasionally in repairing trucks.

HAMMERS:

Ball and peen hammers, sizes 1 lb., 2 lb., 3 lb., 4lb. and 5 lb.
Claw hammers.
Extra hammer handles and wedges.

FILES:

| | |
|---|---|
| Ignition point files. | Mill files. |
| Double cut "midget" files. | Second cut and smooth files. |
| Magneto files. | Rat tail and triangular files. |
| Flat bastards. | Wood rasps. |

Round bastards.
Tap and Die sets: at least two sets covering standard threads, S.A.E. threads and one set for pipe threads (⅛", ¼", ½" and up).

OTHER TOOLS:

Screw drivers, including "Phillips".

| | |
|---|---|
| Pliers. | Taper pins, assorted. |
| Side cutters. | Drift pins. |
| Punch and chisel sets. | Stud removers. |
| Hack saw frames and blades. | Pinch bars and wrenching bar. |

### REPAIR SHOP SUPPLIES

| | | |
|---|---|---|
| Rags. | Friction tape. | Solder and soldering flux. |
| Waste. | Sandpaper. | Asbestos graphite packing. |
| White lead. | Emery cloth. | Sheet packing. |
| | | Braided packing. |

Gasket compound (permatex No. 1 and No. 2 or equal).
Copper tubing, assorted.
Fittings for same, an assortment like the Weatherhead "Junior Merchandiser".
Valve grinding compound.
Penetrating oil; light and special lubricating oils, vaseline, graphite, cutting oil.
Assorted nuts, bolts, and cap screws.
This material should be chosen to provide a wide selection of sizes and threads. Careful study of the equipment to be serviced will show that large quantities of certain sizes will be needed.

| | |
|---|---|
| Flat and lock washers. | Lag, wood, and metal screws. |
| Cotter pins. | Nails and tacks. |

Wire, insulated copper and mild steel wire.
Oil cans, flexible spout and pump type, also one "Locomotive" oiler.

| | |
|---|---|
| Goggles with extra lenses (clear). | Valve grinders. |
| Breast drills. | Valve lifters. |
| Blow torches. | Piston ring compressors. |
| Soldering irons. | Cylinder hone. |
| Body and fender tools and sander. | Ridge reamer. |
| Gear and pulley puller. | Adjustable reamers, assortment. |
| Wheel pullers. | Armature growler. |
| Pulling bars (a set). | Engine cleaning guns. |

Vacuum gauge for tuning motors.

MISCELLANEOUS TOOLS:

"Rough service" light bulbs and drop cords.
Flashlights, batteries, and bulbs.

| | | |
|---|---|---|
| Putty knives. | Whisk brooms. | Scoops. |
| Wire brushes. | House brooms. | Rakes. |
| Scrub brushes. | Street brooms. | Tarpaulins. |

Paint brushes, 2", 4", 1" round.

| | |
|---|---|
| Fuses | Woodruff keys, assorted. |

A complete assortment of grease fittings, nipples, etc. Care should be exercised in compiling this list to include any fittings peculiar to the heavy equipment, as oversize "button heads," etc.

### WELDING SHOP

Complete electric welding outfit with extra cables.
Complete Oxy-Acetylene outfit with extra hoses, tips, and flints.

| | | |
|---|---|---|
| "C" clamps. | Welding and brazing rod. | Brazing flux. |

### MACHINE SHOP

Hammers and sledges. Tongs. Anvil. Forge. Coal.
Hardies, flatters, bottom fullers, top swages, bottom swages, punches and chisels.
Tool steel, cold rolled steel, and mild steel.

### TIRE SHOP

Air compressor with pipe and fittings for pneumatic piping.

| | |
|---|---|
| Extra chucks and washers for chucks. | Extra air hoses. |
| Hot patch vulcanizer. | Valve cores and caps. |
| Gum and rubber for patches. | Blow-out patches. |
| Tire valves. | Tube testing trough. |

Tire hammers, irons, spreader, and gauges.

### BATTERY SHOP

| | | |
|---|---|---|
| Battery charger. | Extra batteries. | Hydrometers. |
| Battery water jars. | Acid. | |

*Continued on page 146*

# *Shots* from the FIRING LINE

## Brown Re-elected Head of American Road Builders

C. W. Brown, chief engineer of the Missouri Highway department, was re-elected president of the American Road Builders' Association at the 41st annual meeting and postwar highway conference held at the Edgewater Beach Hotel in Chicago, February 1-3. Charles Upham and H. C. Whitehurst were re-elected secretary and treasurer of the association, respectively. E. R. Galvin, general sales manager of LeTourneau, Inc., was elected vice-president of the Central district and Samuel C. Hadden, chairman of the Indiana State Highway Commission, was elected a director until 1947. All other officers and directors were re-elected.

One of the highlights of the convention was a panel discussion on the disposition of surplus war equipment. The general conclusion reached was that there would not be much surplus construction equipment in this country at the end of the war, what was here should be distributed through the regular channels of the manufacturers, and that the equipment shipped to other countries should be left in those countries.

Among resolutions adopted by the ARBA in Chicago were the following:

Recommended for passage by Congress legislation to provide for: the extension of federal highway aid to cities; apportionment of such aid to be made through the several State Highway Departments to cities of 10,000 population or over by means of a formula insuring equitable distribution, and the cities making surveys and plans and for entering into contracts and supervising construction.

Congress be urged to strive for the earliest possible enactment of a comprehensive bill covering Federal Aid for state and local highway construction.

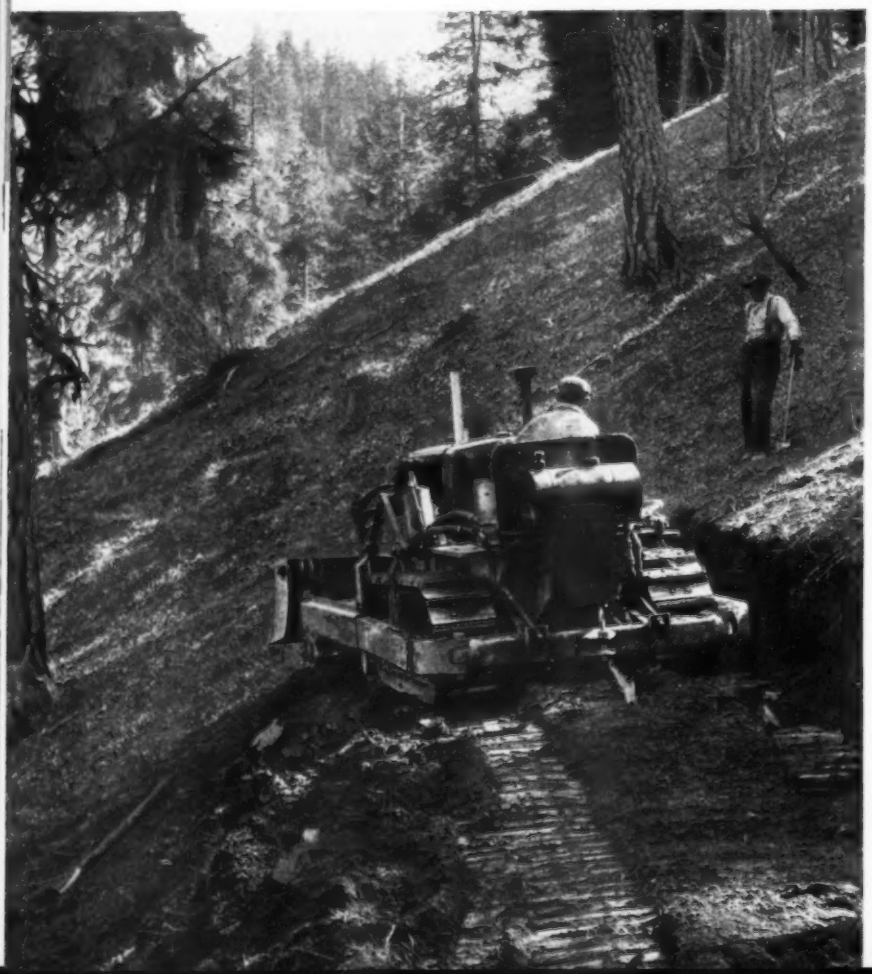
The state highway departments act as agent for the P.R.A. in establishing the standards of design. The counties to prepare, or cause to be prepared, detailed plans, specifications, estimates and contracts and submit them to the state for its approval before receiving bids on them and awarding the contracts.

Reaffirmed its endorsement of the contract system and urged its use on all highway, airport and heavy construction.

The War Production Board was urged and advised to promulgate a conservation order pertaining exclusively to maintenance, repair, and construction of public roads and streets, which shall be amendatory of the supplementary to Conservation Order L-41 and which shall clarify and liberalize this basic order so that public officials charged with the responsibility of providing highway facilities may carry on this work, within designated limits, without being required to obtain permission to initiate individual programs or projects.

That a thorough consideration be given and a complete study made by Congress of the effect of any proposed method of disposal of such surplus materials to best preserve our national economy.

The association reaffirmed its stand that all highway users' revenues be used exclusively for highway purposes, and that the association aid in the adoption of state constitutional amendments prohibiting diversion.



● Caterpillar diesel tractor equipped with Isaacson Trailbuilder building a logging road on the side of a hill through rocks, mud and roots for the Peshastin Lumber and Shingle Co. in one of their timber holdings near Peshastin, Wash. Some of these slopes run as high as 48 per cent.

## Need 30% More Motor Graders than in 1943

Total 1944 requirements for motor graders are 30 per cent higher than the entire 1943 output, which amounted to 3607 units the War Production Board reported to members of the motor grader manufacturers industry advisory committee.

Pending a determination of how many can be manufactured this year, no motor graders will be released for non-military use, including both governmental and other civilian uses, until further notice. All applications for non-military purchase orders are being denied, except those in the first quarter of 1944 already processed.

At this meeting and at the meeting of the pick-up sweeper manufacturers industry advisory committee, discussion of materials revealed that the supply of steel and other controlled materials is adequate, but that difficulty is encountered in obtaining component parts such as rubber tires, transmissions, gears and universal joints.

## Another Gap will Soon be Closed in Histroic Road

The completion of approximately 30 miles of road through Hays, Caldwell and Bastrop counties, Texas, will close another gap in one of the Nation's most

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*SAN FRANCISCO 24: Bucyrus-Erie Company, 390 Bayshore Blvd. Phone Atwater 2341.

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*GEORGIA, ATLANTA 3: Bucyrus-Erie Co., 1508 William-Oliver Bldg., Phone Jackson 1545.
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*ILLINOIS, CHICAGO 3: Bucyrus-Erie Company, 1312 Bankers Bldg., 105 W. Adams Street. Phone Franklin 5321.
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**LOUISIANA,** NEW ORLEANS 13: Wm. F. Surgi, 1001 Magazine St. Phone Raymond 1002-3.

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*MASSACHUSETTS, BOSTON 35: Bucyrus-Erie Company, 240 N. Beacon St., Brighton District. Phone Stadium 3132.
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**MINNESOTA,** CROOKSTON: Wm. H. Ziegler Co., Inc., 1115 So. Main. Phone 271.
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*MISSOURI, KANSAS CITY 8: Bucyrus-Erie Company, 1717 Oak Street. Phone Harrison 4811.
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*NEW JERSEY, ENGLEWOOD: Bucyrus-Erie Company, 214-216 South Dean Street. Phone 3-6727.

**NEW MEXICO,** ALBUQUERQUE: R. L. Harrison Co., 209 N. 4th. Phones 8811-2-3-4.

*NEW YORK, NEW YORK 20: Bucyrus-Erie Company, 30 Rockefeller Plaza, Suite 5050. Phone Columbus 5-4395.
NEW YORK 54: H. O. Penn Machy. Co., Inc., 140th St. and East River. Phone Melrose 5-4800.
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GROTON: Clapp Machinery Co. Phone 154.
MINEOLA: H. O. Penn Machy. Co. Phones Flushing 7-4640, Garden City 4440.
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BRADFORD: Beckwith Machy. Co., 361 Congress St. Phone 3166.
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*PITTSBURGH 22: Bucyrus-Erie Co., 1705 Clark Bldg. Phone Atlantic 4815.
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ABILENE: R. B. George Equipment Co. Phone 6613.
AMARILLO: R. B. George Co. Phone 6185.
DALLAS 2: R. B. George Equipment Co., 1135 S. Lamar St. Phone L. D. 455.
EL PASO: Tri-State Equipment Co., 500 E. Overland Ave. Phone Maine 1526.
HOUSTON 1: Gulf Tractor & Equip. Co., 3100 Polk Ave. Phone Preston 4103, LD-2163.
LUBBOCK: R. B. George Co. Phone 3131.
PECOS: Tri-State Equipment Co.
SAN ANTONIO 6: Wm. K. Holt Machy. Co., West Harding Blvd. Phone Kenwood 7118, LD412.
WESLACO: Wm. K. Holt Machinery Co. Phone 145.

**UTAH,** SALT LAKE CITY 9: The Lang Co., 267 W. First South. Phone 3-5831.

**VERMONT,** BARRE: Reynolds & Son, Inc. Phones 334—335.

**VIRGINIA,** RICHMOND 13: Virginia Tractor Co., Inc., 1628 W. Main St. Phone 5-9138.
ROANOKE: Virginia Tractor Co., 515 Norfolk Ave., S.W. Phone 2-3496.

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**ONTARIO,** TORONTO: F. H. Hopkins & Co., Ltd., Commerce & Transportation Building. Phone Elgin 4094.

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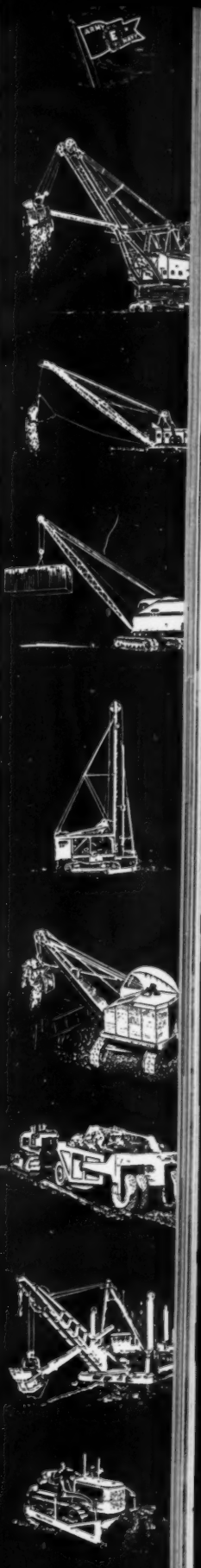


# Bucyrus-Erie

GENERAL OFFICES: SOUTH MILWAUKEE WISCONSIN, U. S. A.

● This Bucyrus-Erie 3-cu. yd. dragline is loading overburden from a Bauxite deposit to a Euclid Bottom-dump wagon on the property of Republic Mining and Manufacturing Company at Bauxite, Arkansas.

historic highways—the Old San Antonio Road.

The first definite route of travel in Texas was established by an expedition under Captain Domingo Ramon in 1716, according to J. M. Owens, District Engineer, Texas Highway Department, writing in the August issue of "Better Roads." The expedition was prompted by the fear of Spanish authorities that the French from Louisiana would infiltrate into east Texas and claim the territory for France. The second motive was a desire of Father Francisco Hidalgo and Father Massanet to establish missions among the Texas Indians.

The expedition set out from San Juan Bautista (near the present Eagle Pass) and most likely traveled through what are now Maverick, Dimmit, La Salle, Frio, Atascosa, Bexar, Comal, Hays, Caldwell, Bastrop, Lee, Burleson, Brazos, Robertson, Leon, Madison, Houston, Cherokee, Nacogdoches, San Augustine and Sabine counties, and thence probably on into Louisiana.

The establishment of missions at what is now San Antonio in 1718 probably served definitely to mark this road as a travel route. It later became known as El Camino Real (King's Highway), and is now known as the OSR (Old San Antonio Road).

## Award Contracts to Build Section of Yakima Canal

Award of contracts, totaling more than a million dollars, to construct a 34-mile section of the Yakima Ridge Canal of the Bureau of Reclamation's Yakima irrigation project in eastern Washington, was announced by Secretary of the Interior Harold L. Ickes. The construction will make irrigation service available for war food production in 1944-45 on 25,600 additional acres of land on the Roza Division of this project.

On the recommendation of Commissioner of Reclamation Harry W. Bashore, the Secretary approved the award of a contract for 11 miles of canal to Axel Osberg and C. H. Ludberg of Seattle, Washington, on a bid of $447,034.50, and a contract for 15 miles of canal to Northwestern Engineering Company, Inc., of Rapid City, South Dakota, on a bid of $252,306. All of this work must be completed in 400 days.

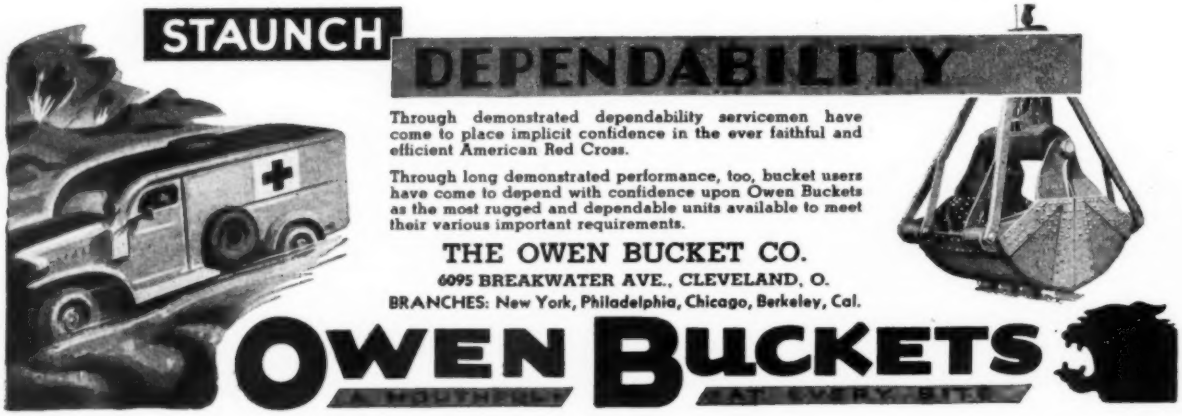
The Secretary also awarded a contract for the construction of eight miles of canal to Scheumann and Johnson of Seattle, on a bid of $127,845, and a contract for a three-mile wasteway to Sather and Sons of Spokane, Washington, on a bid of $235,266. Part of this work must be completed in 160 days and all of it in 350 days.

The construction will complete 85 miles of the 95-mile long canal. Bids will be called for in the near future for construction of the remaining 10-mile section and later for the construction of lateral canals and sub-lateral canals to take the water from the main canal to the various new farms.

About a month ago, Secretary Ickes awarded a contract for the construction of laterals and sub-laterals elsewhere on the Roza Division which would provide irrigation service by the early part of the growing season of 1944 to 5,300 acres. The 9,000 acres under cultivation on this division this year yielded large quantities of vital war foods, including potatoes, beans, and alfalfa for beef and dairy herds. The Bureau provides a full or partial supply of water to 330,000 acres on the Yakima project.

## Hott Corporation Starts Production at Clarion Mine

The Hott Coal Corporation announce that they started production on their mine near Clarion, Pennsylvania, Clarion County, the latter part of January, 1944. The coal will be mined by the open cut method and will be shipped from Clarion, Pa., on the B. & O. railroad. The production will be 500 tons per day until May 1st, and thereafter,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1000 tons per day. The seam is the well-known Kittanning, running about seven percent in ash, and less than two percent in sulphur.

## Chile's Works Program Supported by Tax

To develop a general program of public works, the Chilean Congress has provided that 50 per cent of the proceeds of the special tax now in effect on copper exports be earmarked for distribution as follows: 35 per cent for irrigation projects; 25 per cent for railway improvements; 20 per cent for the development and improvement of port facilities; and 20 per cent for other public works.

Because of lack of sufficient rainfall in the rich agricultural areas of the north-central part of the central zone of Chile, considerable money has been spent on irrigation projects there.

At present 114,000,000 Chilean paper pesos are being spent on the old irrigation systems and the construction of new water facilities. The program for water facilities, now in operation, extends over sections from Ovale in middle Chile to the Kaule River in south-central Chile, and will bring about 60,000 additional hectares of land under irrigation. The largest of the seven projects is in the Bio-Rio River Valley region.

## Northern Pacific Plans Million Dollar Tunnel

Plans of the Northern Pacific Railroad for construction of a million-dollar tunnel on its main transcontinental line between Livingston and Bozeman, Mont., were recently announced by Bernard Blum, chief engineer. It was stated that the project, approved by the War Production Board, would be started as soon as bids could be received and the contract awarded.

The new tunnel, 2,850 feet long, will be bored through Bozeman pass 100 feet north of the present tunnel, which will be abandoned. Built in 1882-84, the present tunnel is too small to provide adequate clearance for the road's modern giant locomotives, Blum said.

The new tunnel will be 18 feet wide and 24 feet high, compared with 16 x 19¾ foot present tunnel. The new tunnel will also be 802 feet shorter.

## No Diversion or Toll-Roads in British Plan

Diversion of highway funds to non-highway purposes and opposition to toll roads is being projected into English plans for post-war highway developments.

"Modern Transport," a London newspaper of the transportation world, points out that "Possible need for free motor roads here was voiced 40 years ago by Mr. Arthur Balfour, the then Prime Minister, who in a remarkable flash of vision said: 'I sometimes dream of great highways constructed for rapid motor traffic and confined to motor traffic.'"

The British Roads Federation has called attention to the fact that during the past 40 years by six millions, England has increased by six millions, but that road mileage had increased only from 174,000 in 1899 to 179,800 at present—a growth of only three per cent.

Editorially, "Modern Transport" says:

"As the payers of a heavy annual tax, of which hitherto a contemptuously small proportion has been spent on road construction and maintenance, road users feel that the revival of the toll road is not merely less than just, but economically unsound."

## Trinidad Studies California Central Valley Project

By R. P. DAY

It may be that the Trinidad Government will copy the Central Valley project of California.

The Governor of the West Indies island himself, the Honorable Sir Bede Clifford, visited the San Joaquin Valley of California in September. In Fresno he marveled at the way the engineers of the U. S. Bureau of Reclamation are

From fighting fronts come many tales of gallant deeds, and not infrequently we have reports of outstanding performance where the fighting man's equipment also plays an important role. One such story is told by a soldier on duty in the southwest Pacific area . . . the story of an Osgood Shovel.

". . . *it cleared the path into the jungles for the men. They also used it in the coral pits to dig out the coral for the roads, which was just as hard as cement and a darn hard job to dig. But the old boy did its job OK without a breakdown.*"

Osgoods are dipping their buckets deep into this globe-girdling combat. Their ruggedness, power, speed and mobility (Osgood measured air control) are winning for them the title of "fighting man's friend." Why not investigate Osgood *now* for dependable post-Victory performance on your jobs?

PREVENTIVE MAINTENANCE WILL KEEP ROLLING STOCK "IN ACTION." WAR BONDS WILL SUPPLY THE EQUIPMENT TO KEEP THE "ACTION" IN OUR FAVOR!

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making the desert productive. He was interested in its flood control and hydroelectric features. In Friant Dam, the Kern-Madera canal system, and Lake Millerton he saw the answer to Trinidad's problem. He was impressed so forcibly that recently, in a message to the Legislative Council, he called attention to the Central Valley Project.

The Trinidad problem is much the same as the one faced by the USBR. Much of the Caroni area in the flat lands east of Port of Spain is either planted in cane or is not productive at all. This land would grow rice, green vegetables and corn throughout the year if an irrigation plan were adopted to supply water during the dry season.

Mr. E. J. Stone, a Trinidadian living in Fresno, California, is also urging the government to copy the Central Valley project. Construction would be financed by selling long maturing bonds, and collecting monthly water rates from the Trinidad farmers who use water from the project.

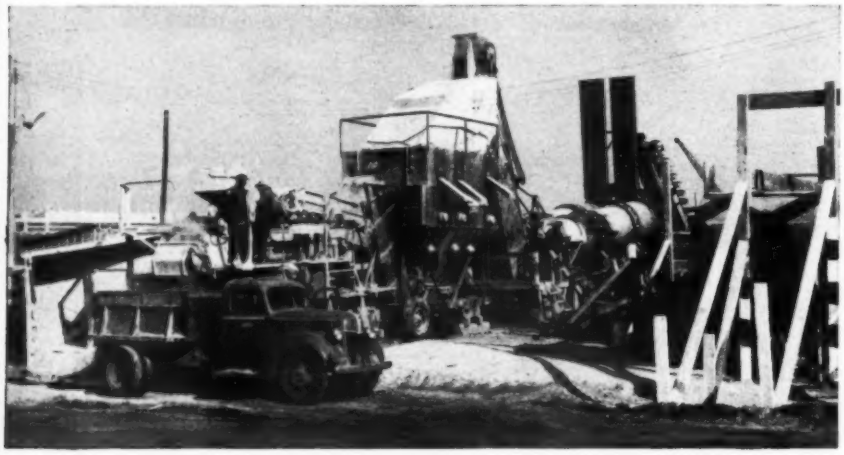
From the point of view of the excavating man, it would not be difficult to reproduce Friant Dam and replicas of the Kern and Madera Canals as a postwar scheme, when earthmoving machines are again made available for work of a civil nature. Caroni Plain, comprising 100 square miles, leads gradually upward from the Caribbean Sea toward the mountain ranges of the northern part of the island 20 miles away. All these mountains are under 3500 feet high.

These mountains catch rainfall which drops in the watershed drained by the Santa Cruz and St. Joseph Rivers. The rivers have a sharp declining gradient in the mountains, but as soon as they leave the foothills they flatten out over Caroni Plain. Here are sites for dams. During the wet season floods pour down the rivers and overtop the banks in the Caroni Plain, ruining crops and very often drowning natives and livestock.

Construction of such a dam as Friant would store floodwater during the rainy season and then, when the land was dry, release the pent up reservoir to assure all crops.

The soil covering the foothills in the vicinity is also ideal for consolidating into an earthfill structure. It is a heavy, red clay-silt, carrying about 17% clay. It mixes with water well, is workable, and is free from gravel deposits. Thus it may be that the final plans might call for an earthfill structure with concrete spillway and irrigating flumes.

At the present time the Trinidad government is considering the advisability of sending a hydraulic engineer to California to get a more detailed idea of the work being done by the USBR, before drafting any comprehensive program.

# B-G Central Plant

Barber-Greene provides a complete, highly accurate, large volume plant for the production of every type of bituminous mix. The dual drum dryer will remove six tons of water per hour or reduce the moisture content of any aggregate to ½ of 1%. The gradation unit combines several operations — surge capacity, sizing, and accurately proportioning the different aggregate sizes. The twin pugmill mixer utilizes an interlocked system for accurately proportioning the aggregate and metered asphalt.

The three basic units are mounted on pneumatic tires for maximum portability and minimum erection time. Erection time is often four days or less with ten men available.

The Barber-Greene Central Plant can be used without the gradation unit for less closely designed mixes thus obtaining the maximum economy and control of the Barber-Greene Mixer.

The Barber-Greene booklet, "Versatility", completely describes the various setups possible and can be obtained from your Barber-Greene representative without obligation. There is no reason for having less than a Barber-Greene.

H6

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BARBER GREENE
AURORA ILLINOIS


## Virginia Road Builders Join A.R.B.A.

Organization has been completed of the Virginia Road Builders' Association, as an affiliate of the American Road Builders' Association, according to Charles M. Upham, Engineer-Director.

"Formation of the new highway group in Virginia fills a need of long standing," Mr. Upham said. "In accordance with A.R.B.A. policies, the new Association will cooperate and assist in the establishment of an adequate national highway program and an adequate state highway program."

The Virginia group's membership represents a cross-section of the road building industry and profession, including engineers, highway users, contractors, equipment dealers, highway officials, material dealers and all Virginians interested in good roads.

Officers and directors selected by the new Association have been in business in Virginia for many years and are recognized as men of outstanding leadership. They are: president, Kenneth L. Black, Richmond; vice-president, Nat Pendleton, Wytheville; secy.-treasurer, Henry C. Hofheimer II, Norfolk; executive secretary, A. J. Rayner, Richmond, and directors, J. T. Cunningham, Jr., Roanoke, W. A. Penick, Richmond, W. Hunter Scott, Franklin, E. W. Hechler, Highland Springs, Robert Barnes, Blackstone, and Frank Echols, Staunton.

## Construction Volume Continues to Decline

The total volume of construction activity in the United States in November, 1943, was $401,298,000, 13 per cent less than the October, 1943 activity and two per cent under the November, 1943,

● Caterpillar diesel tractor with LeTourneau Carryall scraper making cuts and fills on defense road job in New South Wales, Australia. The road eliminates a bottleneck and places main supply road on coastal operations off the sea coast.

schedule, it was announced by the War Production Board.

The November, 1943, activity was 64 per cent less than the $1,101,628,000 volume of November, 1942. Another decrease, 11 per cent, is estimated as the final figure for December, 1943.

The monthly decrease in construction is a continuation of the scheduled decline in this field. It is due in part to the completion of most government financed industrial plants and to the completion of the great bulk of military construction such as camps, cantonments, recreation centers, airfields, storage facilities, etc., which have already been built to accommodate our armed forces. It is further due to the continuation of restrictions under the WPB order limiting construction to the most essential needs only.

Military construction activity continued to drop sharply, 25 per cent, in November and amounted to $132,984,000. In the corresponding month in 1942, work in this category totaled $510,840,000. Construction of aeronautical facilities dropped sharply in November, 30 per cent, and military-housing work decreased 21 per cent, but December work for both these groups is expected to hold the November level.

Other military construction, war rivers and harbors, flood control, passive protection work, etc., dropped 23 per cent in November with another decline of approximately the same ration indicated for December. Navy yards and docks work in the United States as a whole declined 27 per cent in November, with no further decline estimated for December.

Expansion of government-financed industrial facilities, construction volume and machinery and equipment deliveries combined, declined seven per cent in November and totaled $227,345,000, 64 per cent under the $635,464,000 activity in November 1942.

## Start Construction Of Aluminum Pilot Plant

Harleyville, S. C., has been selected by Defense Plant Corporation as the site for the country's first aluminum-from-clay pilot plant. Use of the materials required has been approved by the War Production Board, and construction is already in progress. The contractor is Daniel Construction Company, Inc., of Greenville, S. C., and Birmingham, Ala.

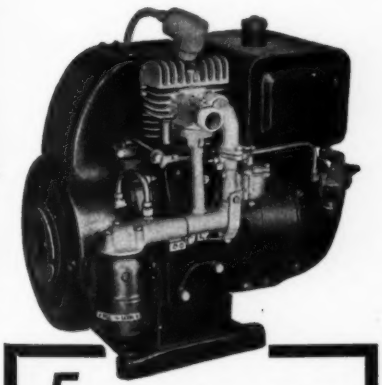
## Bulldozer Called Basic American Weapon

Major General Eugene Reybold, Chief of the Corps of Engineers, Army Service Forces, recently paid tribute to the work being done by bulldozers in Southwest Pacific operations on his return from an inspection trip to that area. Speaking before two thousand plant foremen and supervisors in Peoria, Illinois, early this year, General Reybold said:

"The Jap knows now that the basic American weapon that is rooting him out is that unstreamlined, ungainly, non-stop bulldozer."

Other pieces of Engineer equipment that were accorded special commendation by the Chief of the Army Engineers included tractors, "hysters," motor graders, dump trucks, cranes and shovels, together with replacement parts for them all. Describing a typical construction job in the Southwest Pacific area, General Reybold spoke as follows:

"What American engineers can do with American construction equipment was never better illustrated than in

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Over 65 models, ranging in sizes from 350 to 35,000 watts. 50 to 800 cycles, 110 to 660 volts, A.C.—6 to 4000 volts, D.C.—Also dual A.C.-D.C. output types.

*Descriptive literature sent promptly on request. D. W. ONAN & SONS, 1860 Royalston Ave., Minneapolis, Minn.*

*Awarded to each of the four Onan manufacturing plants.*

ONAN
ELECTRIC PLANTS

the preliminaries to our invasion of New Britain. Before we could gain beachheads on that island, and eventually move against Rabaul, it was essential that we secure control of the Huon Peninsula of New Guinea, just seventy-five miles away.

"The Finschhafen plantations right on the nose of the Peninsula had been held by the Japanese for a year and a half. If, during that time, they had made a real airdrome out of its single landing strip, we would still be trying to fight our way through the banana patches and the bunkers and fox-holes the Japs did manage to construct. As it was, we landed and took Finchhafen last October.

"The Jap soldiers, retreating up the mountainside to Satelberg, were then given box-seats at a demonstration of how to do big things in a big way. Exactly one week after we had brought our construction equipment ashore, our bulldozers and dynamite had cleared a heavily timbered stretch of jungle. Three weeks later our Engineer troops were laying down landing mats on a coral runway more than a mile long. Seventy thousand cubic yards of soil had been moved from the runway and replaced with coral dug from the drainage ditches. The pay-off on that engineering job is that we are now on New Britain.

"When we land to secure a new beachhead, our bulldozers knock ramps through the bluffs that would otherwise stop our trucks and tanks. Bulldozers blaze trails through the jungle. We have even used bulldozers as "points" for infantry columns moving through the jungle. Most of all, however, we have used our tractors and bulldozers to build the mammoth airbases and supply bases from which we are now able to fight back from air, land and sea."

With the rate of the Allied advance from base to base across the Pacific to Japan dependent upon the speed with which operational bases can be built, the importance of earthmoving and construction equipment becomes increasingly evident. Bulldozers are performing their full share in speeding up these operations and helping to build the "road" to Tokyo.

● Caterpillar D7 tractor with Carryall scraper hauling sand to sections of an airfield in Alaska where it is used to fill in soft spots. —*Photo by U. S. Army Signal Corps.*

## Utah Road Commission Adopts Lower Budget

A 1944 budget nearly $300,000 under that of last year was adopted January 21 by the Utah State Road Commission, which expects a decline in gasoline tax revenue and is preparing for a postwar fund.

Through a careful spending program in 1944 and with a carry-over from last year, the commission hopes to add $1,000,000 to a postwar reserve. Its policy also looks for the addition of another $1,000,000 in 1945.

The commission fixed its current year budget at $2,783,000, compared with an expenditure of $3,081,058 last year. These figures include only state funds, and do not include federal allocations. With federal aid expected to be lower

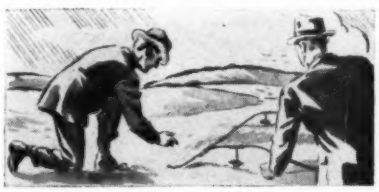
*(Continued on page 134)*

NEED A BIG Trailer?
La Crosse Makes Them Up To 200 Ton Capacity
WRITE OR WIRE
LA CROSSE TRAILER & EQUIPT. CO.
LA CROSSE, WISCONSIN U.S.A.

HAYWARD BUCKETS
USE RIGHT BUCKET FOR THE JOB
Hayward makes all four — clam shell, drag-line, electric motor, orange peel. A Hayward recommendation is unprejudiced.
THE HAYWARD COMPANY
52-54 Church Street
New York, N. Y.

# How a bad connection led to a good one

Every time I see pictures of those Jeeps bouncing across the country I'm reminded of the ride I took with Samson in his old Model T. It was back in '15: Samson was Super at a cement quarry in Illinois, and I was busy with Cordeau-Bickford, the original detonating fuse. He had



*I went along the trunk line*

wired me to drop everything and come out. ". . . and bring a union," were his closing words.

We were hitting the back road hitting the high spots, fast! "What's the hurry?" I gasped.

"I got a hill full of dynamite an' a brand new shovel eatin' her head off," he replied. "We have about 30 feet of good cement rock along here," he added, as we slid to a stop, "but we can't keep ahead of the shovel with just one row, so I decided to sink some more holes. Finished loading night before last — our first Cordeau hook-up. We shot yesterday, and the only thing it did was blow up the cap!"

From where we stood I could see a network of Cordeau: a double row of holes with slit-wrap connections at each hole. I went along the trunk line, making sure that the branch line connections were tight and led off at right angles to the trunk. When I came to the end of the line nearest the face I noticed that it was fused and blackened, so I cut the end off square and clean.

Samson handed me an electric cap and I connected it onto the end of the trunk line with our Special Union — I always took some along when I went on these trips. Then, while he moved the car I ran the wires over the hill to the battery. When all was ready we set off as pretty a blast as you ever saw.

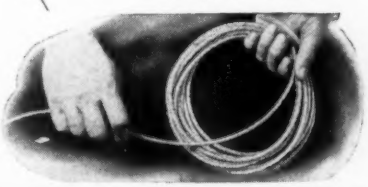
"Let's see one of those unions!" said Samson later, as the train was pulling into the station. ". . . Yeah . . . I guess laying the cap and Cordeau cross-wise under a rock wasn't such a hot idea! . . . It generally pays to follow the manufacturer's recommendation.

"Well, so long . . . and thanks for the union — *and the check-up!*" he added with a grin, as I swung aboard.

**Don't Use Make-Shift Methods! Follow Approved Practices.**

Primacord replaced Cordeau in 1938. It, too, requires the proper placing of the cap but the old slit-wrap is replaced by a simple slip knot, *drawn tight* at each branch line.

THE ENSIGN-BICKFORD COMPANY
Simsbury, Connecticut



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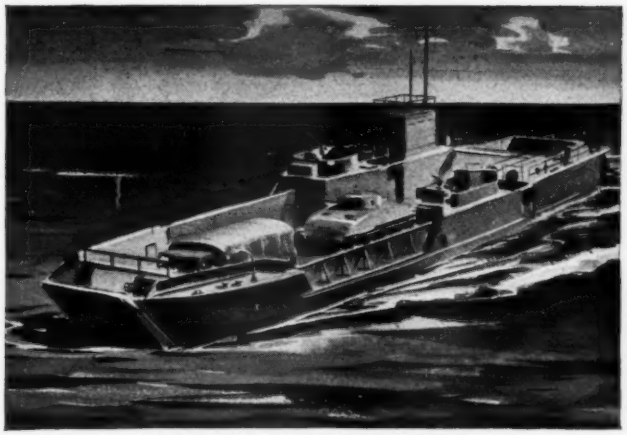
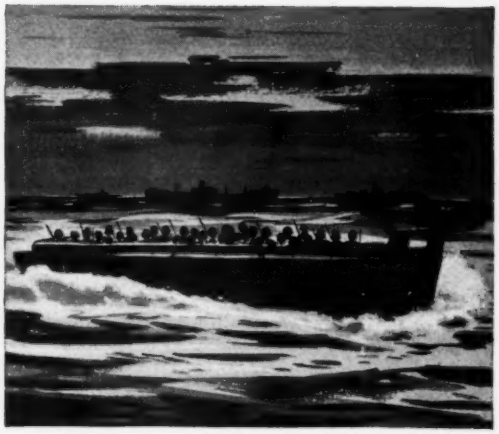
Also Makers of Ensign-Bickford Safety Fuse — since 1836

LCM (Landing Craft Mechanized) 50 ft.
LCI (Landing Craft Infantry) 157 ft.
LST(Landing Ship Tanks) 328 ft.
KEEP AMERICA STRONG
BUY MORE WAR BONDS



LCT (Landing Craft Tanks) 105 ft.



LCV(P) (Landing Craft Vehicle Personnel) 36 ft.

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IN the face of enemy fire these remarkable invasion boats nose in on enemy shores and pour out America's tough fighters and fighting equipment.

They move on split-second orders—must get in and out again by themselves—on the dot, come hell or high water.

It's the kind of service that calls for utmost reliability and quick response.

In these capable craft—from the 36-foot LCV(P) to the big 328-foot LST—you find the engines America and our Allies know so well, General Motors Diesels.

To these engines are assigned the jobs that call for the greatest dependability the engine world knows.

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**ENGINES** . . . *15 to 250 H.P.* . . . ***DETROIT DIESEL ENGINE DIVISION,*** *Detroit, Mich.*
*Engines of this series power the LCI and all the smaller landing craft*

**LOCOMOTIVES** . . . . . ***ELECTRO-MOTIVE DIVISION,*** *La Grange, Ill.*
*Engines from this Division propel the giant LST vessels*

**ENGINES** . . *150 to 2000 H.P.* . . . ***CLEVELAND DIESEL ENGINE DIVISION,*** *Cleveland, Ohio*
*More than 40 types of Navy vessels are powered by engines of this Division*

● Stuck in a New Guinea river during an attempted crossing this 105 mm. gun is given a tow by the tractor.—*Photo by U. S. Army Signal Corps.*

## Shots from the Firing Line

*(Continued from page 130)*

this year, the commission set up only $300,000 for matching purposes, compared with $600,000 in 1943.

Of the total amount budgeted for this year, $1,783,000 is for regular and special maintenance of highways, including snow removal, and $1,000,000 is for other operating expenses. These figures compare with $1,923,580 and $1,158,000, respectively, during 1943.

## National Budget Includes 25 Million for the Mississippi

For the third consecutive year since Pearl Harbor, the Federal Government has recognized the importance of Mississippi River flood control and navigation in all-out war by approving an appropriation of $25,000,000 for levees, revetments and dredging in the Alluvial Valley from Cape Girardeau to the Head of the Passes for the fiscal year beginning July 1, 1944.

This news was revealed when President Roosevelt submitted his annual Budget message to the Congress. The Budget did not contain a breakdown of the $25,000,000 estimate. It merely sets forth that $13,346,000 would be for new work, and $11,654,000 for the maintenance of existing structures. Army Engineers said the breakdown would not be disclosed until they appear before the House sub-committee on War Department appropriations, probably sometime in March.

In contrast with the recommended appropriation of $25,000,000 for the lower Mississippi River, the Budget suggested a token appropriation of only $100 for general flood control. As was the case a year ago, the Corps of Engineers has on hand funds from previous appropriations to resume work on flood control outside the lower Mississippi Valley just as soon as the War Production Board removes its ban against such construction.

The Budget approved an appropriation of $3,630,000 for new river and harbor work, and $43,170,000 for the maintenance of navigation channels and structures.

If the House and Senate accept the Budget's recommendation for the $25,000,000 appropriation for the lower river, the money will be available on July 1 and will be expended almost entirely in the 1944 construction season. But there will be plenty of activity in the Alluvial Valley during the intervening five and a half months, weather permitting, according to Fred D. Beneke, secretary-treasurer of the Mississippi Valley Flood Control Association.

Even before the President had approved the emergency appropriations of $5,000,000 for the lower Mississippi

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ARMY
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River and $3,000,000 for the Arkansas and White Rivers a few weeks ago, Brig. Gen. Max C. Tyler, boss of the river, had begun to advertise levee work on both the east and west sides of the Mississippi between the Arkansas and Red Rivers. To date, U. S. Engineers at Vicksburg have advertised for bids on 9,519,000 cubic yards of earthwork in that important stretch. Part of this work already is under contract. During the coming year 11½ miles of the old Eudora fuse plug between Yancopin and Varucluse will be raised to the 1941 grade and section. Grade revisions on the Mississippi side will be carried forward simultaneously.

Several weeks ago General Tyler announced that if all goes well he expects to place 44,700,000 cubic yards of earthwork in the main line levees during the new construction season. The program is divided as follows: Memphis District, 12,300,000 cubic yards; Vicksburg District, 25,400,000 cubic yards, and New Orleans District, 7,000,000 cubic yards.

## Waterfall Elected President of General Contractors

Clarence Waterfall of Ogden, Utah, was elected president of the Intermountain Branch of the General Contractors of America during its two-day annual convention January 21-22 in Salt Lake City. He succeeds J. P. Gibbons of Salt Lake City.

Joseph W. Grant of Springville, Utah, was named vice-president, and J. H. Tempest of Salt Lake City was re-elected secretary-treasurer. Ed Clyde of Springville and Frank Bowers of Salt Lake City were named directors.

## Colorado Engineer Tells of Life in Solomons

"I've now seen combat from a first row seat and there isn't anything about it that appeals to me or anyone else I've seen," T/Sgt. R. A. McCoy, former resident engineer of the Colorado State Highway Department writes in a letter from the Solomon Islands to W. J. Walsh, assistant division engineer of the same department.

The following exerpts from T/Sgt. McCoy's letter will probably be of interest to state highway department personnel who are carrying on the best they can at home while their former co-workers are on the fighting fronts.

"It (combat) is nothing but strain, worry, filth and danger. There is none of the thrill you feel when seeing movies or reading of battles. The soldiers slog along to the front through mud to their knees and drenched to the marrow, loaded with ammunition and forebodings, and there aren't any bands playing martial airs. There's slop, slop, slop of foot-steps, the booming of cannon, the crack of rifle fire and the monotonous drip of rain into the swamp. The men's faces are expressionless but grim, and they don't seem to feel the physical discomfort at all. Everyone is as tense as a watch spring and every little noise at night puts every man's hand on his knife or gun. After the first few critical days the tension relaxes during the day, but night air raids soon tighten things up again. It's hell in the first degree.

". . . You have never seen rain unless you have seen it in the tropics. We had 13 inches in six hours the other night and it rained all the next day as well. The annual rainfall here is 600 inches, so you can see that it has to rain most of the time, and it does. Our bivouac area is now on a small mountain creek and the night of the heavy rain it was a raging torrent and washed away many men's equipment and almost the men themselves. The water carried along huge boulders and they made a roar like a heavy artillery barrage. A terrific electrical storm was in progress at the same time and all combined it was quite an experience.

"We are within a stone's throw of an active volcano and it makes an interesting sight when the air is clear enough for it to be seen. To date it has only smoked and I hope that is all it does while we're here.

". . . We are very busy at present and I have been doing a lot of surveying with surprisingly accurate results. We ran a 13,000 foot traverse with a 0.4 ft. closure error. Most of the help is inattentive and lackadaisical and requires infinite supervision of detail. But somehow we manage to get things done.

"I've read articles written by U.S.O.

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The smooth, non-grabbing action *adds miles to tire life.*

Dependable stopping action under all service conditions *protects equipment* and reduces fatigue of operators.

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● Caterpillar diesel D-8 tractor with LaPlant Choate trailbuilder clearing land for the construction of the Alaskan Highway through the wilderness of Northern Canada. —*Official U. S. Signal Corps Photo.*

Commandos in the States which say that the folks at home shouldn't send overseas soldiers such things as candy, cake, etc., as the overseas PXs. are well stocked with such things. You should see our PX stock — Lifebuoy soap and Marlin razor blades, and, once in a while, some jaw breaker candy. My wife sent me some canned chicken, olives and other stuff which was a wonderful treat. Corned beef and dog biscuits get very, very tiresome and the thought of a dehydrated potato or cabbage almost nauseates me."

## South Dakota Groups Hold Annual Meetings

At wartime business meetings, shortened to one day, the Associated Contractors of South Dakota and the South Dakota Society of Engineers and Architects recently elected officers for 1944.

The contractors, meeting at Sioux Falls, re-elected all officers. They are George Douthit of Sioux Falls, president; Roy Rose, Watertown, vice-president; L. F. Boyce of Sioux Falls, secretary and Herman Claus of Sioux Falls, treasurer.

E. D. Dake of Rapid City was elected 1944 president of the Society of Engineers and Architects at its annual meeting in Huron. Mr. Dake succeeds R. E. Bragstad of Sioux Falls. Other officers are: Bragstad, vice-president; H. M. Pierce, Huron, secretary-treasurer; and William H. Gamble of Brookings, W. F. Blatherwick of Sioux Falls, P. H. Schultz of Pierre and W. F. Cochrane of Omaha, Neb., council members.

## Earnshaw Elected President of Crushed Stone Group

Fred O. Earnshaw of Carbon Limestone Co., Youngstown, Ohio, was elected president of the National Crushed Stone Association at an annual meeting in New York. He succeeds William N. Andrews of New Castle, Pa. Milo A. Nice of Hercules Powder Co. was elected chairman of the Manufacturers Division to succeed J. Harper Fulkerson of Cross Engineering Co.

Edward W. Bauman, formerly chief of the non-metallic section of the mining division of WPB, is the newly appointed field engineer of N.C.S.A. His work is to assist in the field in solving technical problems of the crushed stone industry.

## Postwar Civilian Airport Program Anticipated

The shape which may be taken by a broad program of federal aid for postwar civilian airport construction was indicated at a conference sponsored January 27 in Hartford, Conn., by the Aviation Committee of the Connecticut State Development Commission.

Outlining what he considered feasible in the way of federal subsidization of postwar airport construction, Federal Civil Aeronautics Administrator C. I. Stanton compared it to the long-established program of federal aid for highway development.

Stanton said that federal funds might be apportioned to the states on the basis of area, population and number of civil aircraft in operation, with the number of existing airports as a "modifying factor." It would then be left to the states themselves to decide for what projects the funds should be used. In projecting an overall plan for airport development the Civil Aeronautics Administration might be of assistance, he said, while contracting and construction of airports would remain the business of the states.

Francis S. Murphy, chairman of the committee sponsoring the conference, said that he understood "from reliable sources" that the federal government may be prepared to expend sums equaling "in the neighborhood of 50 to 75 per cent" of the costs of local airports. He asked the CAA administrator if he was prepared to comment in any way on what might be expected in the way of federal assistance.

Stanton replied that no funds existed at present for such aid, but that he could only state "from perhaps unreliable sources" that a 50-50 proposition might be worked out. Such assistance, he said in answer to another question,

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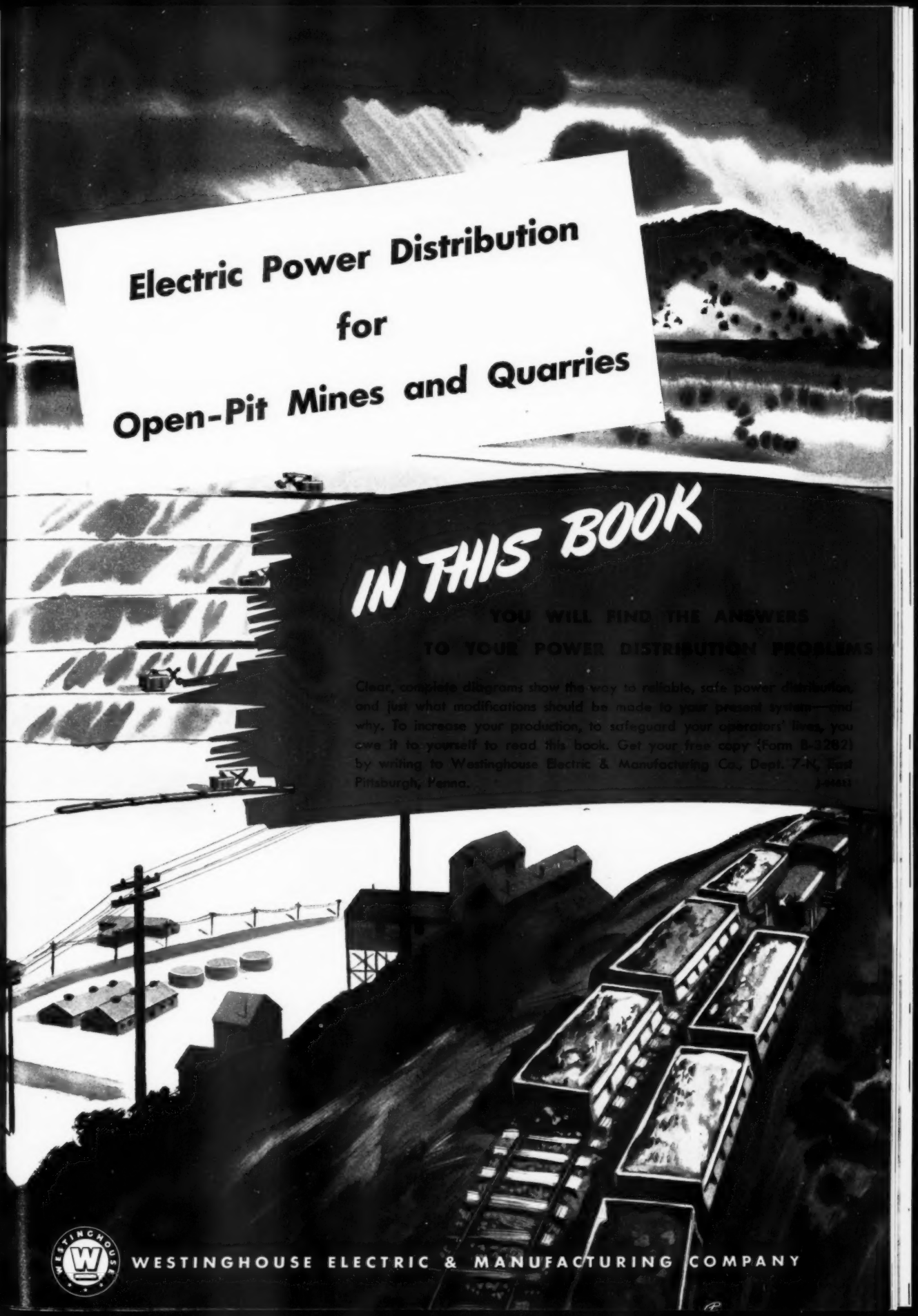
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● 87th Engineer Battalion (Heavy Pontoon) placing treadways with help of crane.—*Photo by U. S. Army Signal Corps.*

would probably include improvement of existing airports as well as new construction.

Belief was expressed by Stanton that this country's prewar total of 26,000 civil aircraft might rise to 300,000 or 500,000 by 1950. Of this number, he said, perhaps only 3,000 would be commercially owned.

He suggested that one aim of airport development by the states should be to offer facilities for large numbers of private owners, who would prefer small airports closely adjacent to areas in which they live, rather than simply a network of large airports. In general, he said, the problem should be thought of "in terms of local needs rather than building monumental airports to compete with the monuments of some nearby city."

## Over 12,000 Items of Used Equipment Supplied

Through inventories set up in the War Production Board Regional offices, 12,728 items of used construction equipment were supplied for construction jobs in 1943, WPB's Construction Machinery Division announced. These items are conservatively valued at $64,000,000 and represent a saving of approximately 126,000 tons of raw materials, since they were used in place of new equipment.

Approximately 90 per cent of all new construction equipment is now needed overseas. Civilian needs at home can be filled only through putting all idle used equipment into service.

Inventories of used equipment are compiled in the regional offices through registration of machines within seven days after purchase and registration of change of ownership of machines, as required by order L-196. As of October 15, 1943, the latest date for which consolidated figures are available, 332,181 items were registered, exclusive of equipment owned by the military services.

Types of heavy equipment most in demand—shovels, cranes, draglines and backhoes; motor graders; and tractors must be registered. Many more types had to be registered when the order was first issued in August, 1942, but the number has been reduced through successive amendments. The consolidated inventory of used equipment (October 15, 1943) included 9,320 crawler cranes; 1,645 truck cranes; 33,113 graders; 14,401 shovels, and 48,322 tractors.

## Franklin Thomas Installed in Civil Engineer Post

Representing the Pacific Coast area, Professor Franklin Thomas of the California Institute of Technology was installed January 25 in New York as a regional vice-president of the American Society of Civil Engineers. Thomas is chairman of the division of civil and mechanical engineers, aeronautics and meteorology at Caltech and is a member of the board of directors of the Metropolitan Water District here.

## New Bulldozer Use

The U. S. Bureau of Mines is trying out a new method of exploring brown ore deposits in the West Plains area of Missouri. It is using a bulldozer to run trenches across the orebodies, giving an excellent opportunity to carefully sample the walls of the trench. Some test pitting is also being done.


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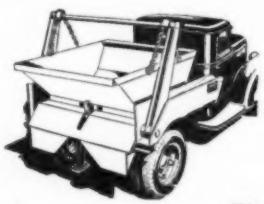

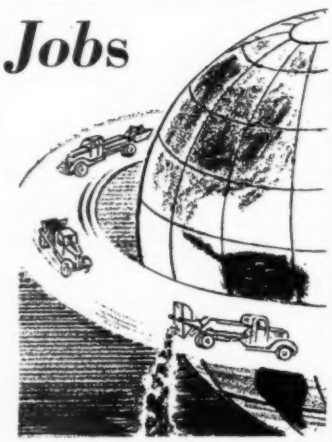

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Whether it is excavating, stripping overburden, feeding crushers, road building, construction work, moving stock piles or other material-handling jobs . . . you can transport more yardage per day with less man-power and lower costs, when you use the LOAD LUGGER with a number of detachable dump buckets. It eliminates waste time of trucks waiting to be loaded, because you can haul and dump the buckets while the empties are being refilled on the job. Ask for Catalog No. 44.

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# ADAK'S tough clay can't stop 'em!

Yes, Northwests are working alongside the Marines on America's far flung battle lines, but that is not the point. The real point is that, whether they are in the tough, stiff clay of "Adak" or the hard rock of "Shipshaw", Northwest shovels, cranes and draglines are establishing an unequalled reputation for dependability, low cost operation and high output. • They are doing the kind of job that you are going to want done on post war contracts. • On the jobs you are on, watch the Northwests at work—ask how the Northwests are doing! • We'll be glad to help you with information for your future plans.

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-and when you have a real Rock Shovel you won't have to worry about output in dirt

# NORTHWEST

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

# —1883— W. E. Callahan —1944—

W. E. Callahan, a member of a family of contractors and chairman of the board of the W. E. Callahan Construction Company of Los Angeles, California, died suddenly from a heart attack in Dallas, Texas, one day before his sixty-first birthday.

He was born on January 6, 1883, and entered the contracting business early in life when he spent all his time during holidays from school with his father, W. F. Callahan, and his uncle, Edward Callahan, who started building railroads when railroads were pioneering their westward expansion.

Mr. Callahan graduated from Creighton University in Omaha, Nebraska, where he was a star quarterback on the football team.

W. E. Callahan was fundamentally a dirt mover and brought to bear upon this industry his enthusiasm and unflagging interest in improvement of equipment. As a result many of the improvements in equipment and methods for moving dirt can be partially attributed to him.

With the assistance of John Monighan, who owned a machine and boiler shop in Chicago, and John W. Page, a full revolving steam excavator with a clamshell bucket suspended from a wooden boom was built for excavating a section of the Hennepin Canal. This excavator was mounted on skid and rollers and was the forerunner of the modern dragline. This excavator, while a distinct innovation, was far from perfect. Mr. Callahan realized the need for improvements and constantly urged his men and the equipment manufacturers to make them, and helped them with his suggestions.

In 1912 W. E. Callahan founded his own construction company with headquarters in Omaha. Associated

*(Continued on page 142)*

# —1868— Walter Alexander Rogers —1944—

Walter Alexander Rogers, Chairman of the Board of Bates and Rogers Construction Corporation of Chicago, Illinois, one of the foremost construction companies in the country, who died a few weeks before his seventy-sixth birthday anniversary, was born in Milwaukee, Wisconsin, on January 19, 1868. He spent his early boyhood on a farm near Milwaukee. After finishing high school in Milwaukee he entered the University of Wisconsin and graduated with the degree of civil engineer in 1888. He was awarded the John Johnston Fellowship and remained at the university for a year to teach mathematics and do research work in the comparatively new subject of concrete. Mr. Rogers organized a cement and concrete testing laboratory at the university, the first of its kind in the country.

From 1889 to 1901 he was employed in executive engineering capacities by several railroads. In 1891 he married Julia Margaret Cushing, who attended high school and college with him.

On April 26, 1901, with Onward Bates he organized the Bates & Rogers Construction Co. From 1909 until 1937 he was president and active head of the company.

In the early days of the Bates &

Rogers Construction Co. the firm built such structures as the Tennessee River bridge for the Illinois Central Railway, one of the early irrigation dams for the U. S. Reclamation Service at Minidoka, Idaho, and the bridge and tunnel lining for the Chicago, Milwaukee, St. Paul and Pacific Railroad through the Bitter Roots mountains in Montana. The company also constructed all the bridges and lined a number of the tunnels for the Grand Trunk Pacific Railway.

During the first World War the Bates & Rogers Construction Co. devoted its facilities to extensive war work.

In 1937 Mr. Rogers was made chairman of the board of the Bates and Rogers Construction Corporation and one of his sons, Lester C. Rogers, became president. The firm continued its tunnel work in building Blue and Kittatinny Mountain Tunnels for the Pennsylvania Turnpike.

When the country entered the present war, Mr. Rogers' firm again placed their organization and facilities at the disposal of the government, and under his chairmanship creditably performed over $100,000,000 worth of war work.

Mr. Rogers' firm also had the major interest in a joint venture known as Quincey Barge Builders which built

*(Continued on page 142)*

# DYNAMITE IN SLOW MOTION

TRANSLATING THE DETONATION of an explosive into a continuous line . . . and thus charting the exact rate at which pressure is developed is one of the tasks of the recording device pictured above. In effect, it produces a slow-motion picture of an explosion so that its characteristics may be accurately observed.

Through apparatus such as this in one of the most modern laboratories, Hercules technicians study the behavior of explosives of almost every type . . . and thus add to their background of knowledge. It is this wealth of experience—in research, in the field, and in manufacturing—that maintains a constant vigilance over the quality of Hercules explosives, for your benefit and ours.

*HERCULES EXPLOSIVES*

HERCULES POWDER COMPANY
INCORPORATED
972 King Street
Wilmington 99 . . . Delaware

XR-41

## W. E. CALLAHAN

*(Continued from page 140)*

with him were his father, W. F. Callahan, his brother A. J. Callahan, and J. A. C. Kennedy.

Drainage in the middle west was coming to the fore and the W. E. Callahan Construction Co. became one of the largest drainage contractors in the country, doing this type of work in Iowa, Nebraska, Kansas, Missouri, Arkansas, Louisiana, and Texas.

Concurrently with the drainage work being done by the W. E. Callahan Construction Co., contracts were taken for flood prevention work on the Kaw River, at Kansas City, and the Scioto River in Columbus, Ohio. The company also did the excavation for the Union Station in Kansas City, Missouri.

In 1920 W. E. Callahan formed a partnership with L. D. Crawford, now a Colonel in the Air Force, known as Callahan & Crawford which specialized in irrigation and drainage work in the Rio Grande Valley in Texas.

When the levee program on the Mississippi River, which entailed the use of very large draglines, was started, W. E. Callahan was ready. The W. E. Callahan Construction Co. had two 10-W Monighan draglines and two 6-W's to put on this work. The company continued to work on the Mississippi River levee program until it was completed and then shipped the large draglines to California where the W. E. Callahan Construction Co., in conjunction with Gunther & Shirley Company, had the contract for the construction of the All American Canal.

Early in 1920 the W. E. Callahan Construction Co. started building earth fill and concrete dams. Here again W. E. Callahan was willing to try an innovation in dam building by the hydraulic fill methods on Kemp Dam near Wichita Falls, Kansas, and Garza Dam in Dallas, Texas. Other dams built by the W. E. Callahan Construction Co. were the Waco Dam at Waco, Texas, Nashworthy Dam in San Angelo, Texas, Prado Dam, Corona, California, Alcova Dam and Tunnels in Alcova, Wyoming.

The W. E. Callahan Construction Co. is a member organization of the Pacific Constructors who are building Shasta Dam in Northern California.

Mr. Callahan was a member of the Board of Directors of Pleasantville Constructors, which company built a section of the Delaware Aqueduct near the Hudson River. In 1931 the W. E. Callahan Construction Co., together with Petterson, Shirley & Gunther, were awarded the contract for the building of Madden Dam in the Canal Zone.

During the pre-war defense program and the present war program, the W. E. Callahan Construction Co. has participated in work in the Hawaiian Islands, Southwest Pacific, Canada, Alaska, Arkansas, Texas, Utah and the Bahamas.

Through the years Mr. Callahan, in addition to his interest in the improvement of equipment for dirt moving, was always equally interested in the personnel of his company. He was quick to see outstanding ability and loyalty and even quicker to award such characteristics by giving his men more responsibility, constant encouragement, and substantial financial rewards. As a result, he has brought forward in his company many engineers and construction men who have prospered with him and who today are able to carry on the business

Early in 1943, after a long and successful career, Mr. Callahan retired from active participation in the affairs of his company and became Chairman of the Board of Directors. He was succeeded as President by Paul Grafe who joined the organization in 1922.

Mr. Callahan is survived by his widow, the former Lucille Cassidy of Omaha; two daughters, Mrs. Vincent Flynn and Mrs. William Flynn of St. Louis; two sisters, Mrs. Mark Walker of Omaha and Mrs. T. W. Cullen of Riverside, California, and a brother, Fred Callahan. Mr. Callahan was a member of the Knights of Columbus, the Dallas Athletic Club and the Brook Hollow Country Club of Dallas, Texas.

So that's one of those bigger pay loads the crane man swears by!
HAISS Hi-Power Digging Buckets in one recent, competitive test showed 40% better efficiency than the next best—due largely to superior design of its closing gear. It pays to say "Haiss"
HAISS
DIGGING BUCKETS
GEORGE HAISS MANUFACTURING CO., INC., 144th St. & Park Ave., New York 51, N.Y.
*Bucket agencies throughout the country Write, wire for prices, delivery or catalogs.*

## WALTER ALEXANDER ROGERS

*(Continued from page 140)*

large numbers of tank landing craft and floating dry docks for the Navy.

Mr. Rogers was greatly interested in the construction industry as a whole and was one of the original group that organized the Associated General Contractors of America. He was the second president of the AGC and he continued to take a major interest in the growth and standards of the industry throughout his lifetime.

He resided on his beautiful farm near Glen Ellyn, Illinois, with his wife

*(Continued on page 158)*

# LITTLE THINGS
## That lead to big dragline output

In addition to such major factors in dragline output as job layout, operator's skill, careful lubrication, proper clutch and brake adjustment, etc., a host of details can swell the production record. Here are just a few:



1. Keep boom at highest angle possible for particular job.

2. Do not use bucket of larger capacity than recommended for normal rapid operation.

3. Keep bucket teeth sharp and built up to proper size. This will protect lip from unnecessary wear, as well as increase digging speed.

4. Inspect drag chains regularly, paying particular attention to end links which are subject to greatest wear. Chain life can often be increased by reversal or by cutting chain in middle and using repair links to reverse sections.

5. Do not pull drag chain into fairlead.

6. Hoist bucket from digging as soon as it is filled.

7. Watch fairlead. Keep sheaves lubricated and well bushed. Clean out regularly dirt brought in by rope.

8. Short lengths of cable salvaged from hoist or drag ropes can be used for dump cable. Be sure length is same as original dump cable to insure best dumping characteristics.

BUCYRUS ERIE

ARMY E NAVY

# Bucyrus-Erie

SOUTH MILWAUKEE, WISCONSIN, U. S. A.

# Field NOTES

## Sketch Repair Parts

An excellent plan when ordering repair parts is to always make a rough sketch of the machine or portion of the machine that must be repaired or replaced.

It is a very simple matter to make a rough sketch distinct enough so that the manufacturer of the machine or part can easily tell what the customer is trying to sketch. By means of an arrow, point out the part that is wanted.

If there is a number on the machine, give the number. The more information given to the manufacturer the better, and the more promptly can the repair be made.

To merely inform the manufacturer that "the cast iron gear on the north side of the machine we bought from you is broken," is not sufficient. Yet manufacturers commonly receive "explanations" just as vague as this.

Do not use the words, "right," "front," "left," or "rear" if the machine has no particular "right," "front," "left," or "rear."

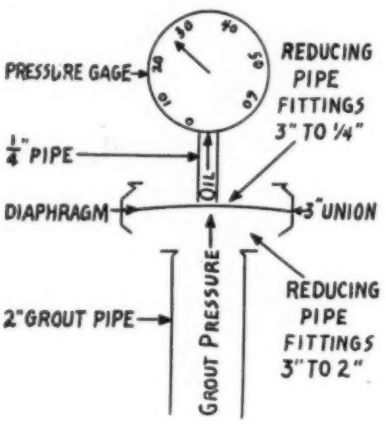
The easiest and best way is to make a helpful sketch even though it may be very rough.

W. F. SCHAPHORST, M.E.

## Increased Service Life for Gauges

Wherever high pressure grouting is done engineers are often wrestling with the problem of keeping pressure gauges in accurate operating condition. The general type of pressure gauge used in this work in the past often admitted grout into the gauge tube, where it mixed with the oil in the pressure column and set up, often ruining as many as two gauges a day.

To save the expense of replacing these instruments on a recent Southern California project, a rubber diaphragm was cut from one-fourth-inch standard Garlock gasket stock to fit flush inside a three-inch union. The diaphragm, resting against the oil column on one side, was forced inward by grout pressure on the other, giving an accurate pressure reading but preventing the grout from mixing with the oil.




The three-inch union is in the center of a "Christmas Tree" system of pipe fittings which transmits the pressure from grout in the two-inch grout pipe to the one-fourth-inch column of the gauge. Through practical experience it was found best to provide fittings at the diaphragm slightly larger in diameter than the regular line. Thus the pipe increased from two-inch to three-inch, reducing ultimately to a one-fourth-inch size at the oil pressure column.

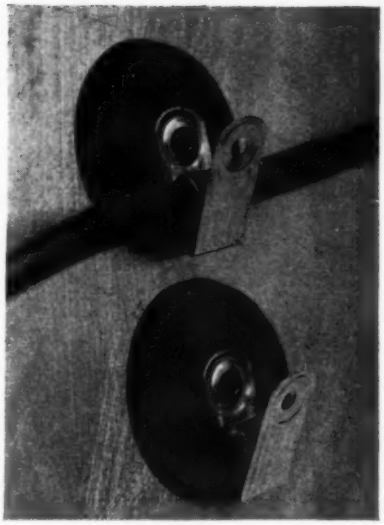
The service life of high pressure gauges so equipped was increased from a day to three months. On low pressure grouting the gauges will last indefinitely.

by FLOYD SUTER BIXBY

## Buck-toothed Bulldozer

Lewis Construction Company found a deposit of good gravel for surfacing the Yuma-Quartzite (Arizona) highway, and used an RD 8 Caterpillar to move the material to the feeding hopper of a portable Cedar Rapids crusher. Eight 16-inch sections of 1 x 6-inch plow steel were welded on the cutting edge of the bulldozer to loosen the gravel. When the deposit became too hard for efficient operation with this set up, a buck tooth was added to the machine and the dozer "went to town." A section of 2 x 5-inch steel was cut to shape with a torch and bolted and welded between two 6 x 6-inch angles. These were bolted through the dozer blade leaving two feet of the central bar to enter the ground. The tooth was built up by welding to three inches wide at the lower end and hard faced.

JOS. C. COYLE

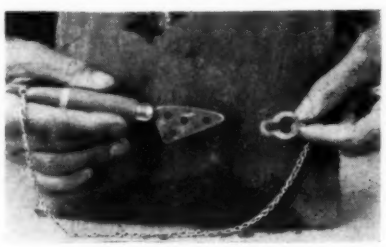


● Rubber vacuum cups can be utilized to hold electric light cords to smooth surfaces.

## Temporary Holder for Electric Light Cord

To temporarily support on smooth surfaces common rubber covered electric light cord generally used around the job shop, office or where temporary lighting or minor power facilities are needed, is often not only a convenience, but is also a matter of safety. The ordinary inexpensive "Forget-me-not" vacuum sticker buttons are very handy for this use. The shape of the metal clip is just about right to go around and hold an electric light cord without cutting or damaging it in any way. If too snug, the clip can be sprung open a little. The illustration shows how a light cord can be kept off the ground by attaching it to smooth surfaces through the use of vacuum cups.

FRANK W. BENTLEY, JR.



● An old kitchen plate scraper makes a handy tool for cleaning shovels and other hand tools.

## Plate Scraper as a Shovel Cleaner

An ordinary kitchen plate scraper can be readily made into a very handy and convenient cleaning tool for shovels and other ground tools which

*(Continued on page 147)*

# For Air Economy use *Thor* ROCK DRILLS

AIR INPUT Measured to .00025 of an inch for Balanced Power . . . Smooth Performance.
Spaces between the flanges and chest shoulders of this patented Thor Valve are controlled to a tolerance of .00025 of an inch to turn into power ALL air that enters the tool.

● Thor Rock Drills develop rock-smashing power and speed from every ounce of air that enters the machine through the patented Thor Positive Short-Travel Tubular Valve which controls air power by tolerances of .00025 of an inch!

*Balanced power* is one feature of such fine control—because only a precisely governed quantity of air is allowed behind the piston.

Smooth performance is another feature—because every stroke is powered by the same measured quantity of air.

And *air economy* is assured throughout the life of the Thor Rock Drill—because there are no separate parts of this patented Thor valve to lose or wear.

*Thor* *Portable Pneumatic and Electric Tools*

**INDEPENDENT PNEUMATIC TOOL COMPANY**

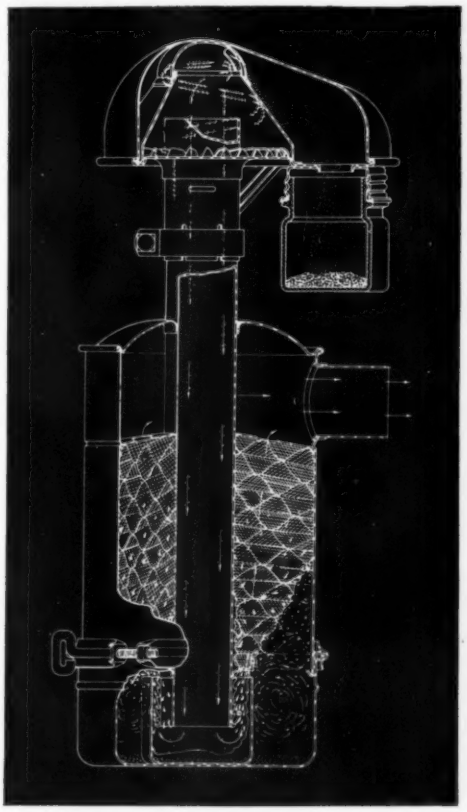
600 W. JACKSON BOULEVARD, CHICAGO 6, ILL.
Branches in Principal Cities

NEW HELP FOR YOU! Find the *right* air tools you need to speed your work, in the latest edition of Thor catalog 42A. Write for it today.

# DONALDSON Oil-Washed AIR CLEANERS

## Note These DONALDSON Features

1. **Non-plugging element: Manufactured from lead-coated wire. Open area of element pre-determined and can be uniformly controlled in manufacture.**
2. **Cleaning is done by scrubbing: The element functions as a condensing chamber . . . not as a filter . . . thereby minimizing the possibilities of dirt becoming lodged in the element.**
3. **Ease of service: Under normal operating conditions, cleaning and servicing of the oil cups is all that is required.**



4. **Submerged air inlet insures displacement of oil and high cleaning efficiency regardless of load or operating speed.**
5. **One hundred per cent pressure tested.**
6. **For extreme dust conditions pre-cleaners can be provided to increase the time between service periods.**

**Our engineers will be glad to help YOU work out the best Donaldson installation for your product. Write us . . . no obligation.**

**DONALDSON CO., INC.**
**666 Pelham Blvd., St. Paul, Minn.**

# Construction Equipment Breakdowns — *Continued from page 123*

## FILLING STATION

Gasoline cans.
Kerosene cans.
Tank Wagon buckets.
Drums equipped with faucets.
Water buckets, some with spouts for filling radiators.
Lubricating oils, greases, gasoline, and kerosene.
Anti-freeze compound.
Anti-freeze testers.
Brake fluid.
Filter cartridges.
Funnels, two gallons and two quart sizes.
Oil measures, four quart thumb controlled.
Lubricating oil pumps.
Rotary barrel pumps with hose.
Extra fuel oil and gasoline dispensing hose.

## PARTS LIST

(a) *Parts needed to Maintain the Engines in Heavy Equipment, Power Shovels, Graders, and Bulldozers.*

The engines used in heavy equipment vary considerably, therefore the quantities of parts required cannot be estimated except on a prescription basis. It may be assumed however, that each of them will require one major overhaul in a year of intensive operation and the following general suggestions are based on that assumption.

Spark plugs.
Fan belts.
Fuel pumps.
Engine kits, including valves, sleeves, pistons, inserts, main bearings, and gaskets.
Extra gaskets.
Injector repair kits.
Generator brushes and fuses.
Magneto repair kits.
Extra lubricating oil pump.
Oil and fuel filters and gaskets.

(b) *Other Parts and Supplies Needed to Maintain a Power Shovel for a Year*

One set of lined bands comprising those for swing, hoist, crowd brake, and booster.
12 sets factory band lining with rivets.
1 set of bushings and pins for dipper.
1 set of bushings and pins for caterpillars.
Sheaves, shaft, and bushings for point of boom.
2 snatch block sheave pins and bushings.
1 set of dipper stick wearing plates.
1 set of swing collects, if used.
Summer or winter fan.
1 extra battery.
Material to replace pipe lines subjected to vibration.
2 extra sets of teeth and fastenings.
12 or more sets of points for resteeling teeth.
Welding rod for applying hardened tip to resteeled teeth.
Cable.
Cable clamps.
Chisel type cable cutter and annealed mousing wire.
Special wrenches and grease guns.

(c) *Other Parts and Supplies Needed to Maintain Two Road Graders for a Year.*

4 to 6 cutting edges for blades per machine.
2 sets clutch facings.
1 complete clutch.
1 complete transmission.
1 hydraulic piston rod and packing for blade controls.
Assortment, hydraulic system packing.
Assortment, high pressure hose.

(d) *Other Parts and Supplies Needed to Maintain Four Bulldozers for a Year.*

4 to 6 cutting edges for blades per machine.
4 Hydraulic system valves.
1 Complete hydraulic lift unit.
Extra final drive, transmission, and clutch seals.
4 Sets of pins and bushings.
1 Set of rails (for up to 10 tractors).
12 Track shoes.
4 Sets master and steering clutch facings.
4 Sets upper track rollers.
1 Set bottom rollers.
1 Set front idlers.
1 Set rear sprockets.
4 Extra draw bar pins.
Assortment, packing for hydraulic system.
Assortment, high pressure hoses and clamps.
1 Press for installing pins and bushings if none is available locally. Special wrenches and grease guns.
4 Sets brake linings.

(e) *Parts needed to maintain a fleet of Ten (10) new dump-trucks—equipped with Four (4) Cubic Yard bodies, for One (1) Year.*

### ENGINE

3 Sets standard size piston rings.
3 Sets standard size bearing inserts.
6 Sets engine gaskets.
3 Sets valve springs, guides, push rods, lifters, locks and rocker arms.
2 Sets valves.
2 Oil pumps.
4 Water pumps.
3 Sets pulleys (generator, crankshaft, water pump).
2 Fuel pumps.
5 Fuel pump kits.
2 Carburetors.
5 Carburetor kits.
4 Sets gas lines and fittings.
3 Distributor caps.
2 Distributors.
3 Distributor rotors.
6 Sets distributor points.
3 Condensers.
3 Coils.
3 Sets ignition wires.
2 Oil gauges (engine and dash units).
6 Standard pistons and pins.
6 Connecting rods.
1 Crankshaft.
1 Camshaft.
6 Radiator cores and caps.
12 Sets radiator hose and clamps.
6 Water pump kits.
6 Fan assemblies.
4 Sets fan belts.
120 Sets spark plugs and gaskets.
1 Generator.
2 Generator arms.
6 Sets generator brushes.
1 Starter
1 Starter arm.
4 Sets starter brushes.
3 Voltage regulators.
1 Air cleaner.
3 Ignition switches and cables.
2 Ammeters.
3 Thermostats.
2 Oil filters.
150 Oil filter cartridges.
5 Accelerator pedals.

### CLUTCH

3 Pressure plate assemblies.
6 Pressure plate kits.
12 Lined discs.
6 Clutch pilot bearings.
6 Clutch throwout bearings.
2 Clutch pedals.
6 Clutch pull back springs.

### TRANSMISSION

1 Complete transmission.
3 Sets transmission gears, shafts, and bearings.
5 Sets transmission gaskets.
3 Complete gear shift levers.

### DRIVE LINE

5 Complete drive shafts.
10 Complete front universal joints.
10 Complete rear universal joints.

### DIFFERENTIAL

1 Complete rear end.
15 Ring gear and pinion sets and bearings.
3 Complete spider gear assemblies.
15 Sets spider gears, washers and shims.
15 Sets axle drive gears.
20 Sets gaskets.
25 Axle shafts and gaskets.
20 Sets axle studs and nuts.
10 Rear differential covers and plugs.

### BRAKES

10 Sets lined brake shoes.
3 Front wheel cylinders.
3 Rear wheel cylinders.
3 Front wheel cylinder kits.
3 Rear wheel cylinder kits.
2 Master cylinders.
2 Hand brakes complete with hand and lining.
1 Set brake drums.
4 Master cylinder kits.
3 Sets complete brake lines.
1 Brake booster complete.
4 Brake booster kits.
2 Brake pedals.
6 Brake pullback springs.

*(Continued on page 147)*

*(Continued from page 146)*

**HOIST**

**2 Power take off units.**
**6 Sets power take off gears, shafts, bushings and gaskets.**
**6 Drive shafts.**
**10 Sets drive shaft "U" joints.**
**2 Hoist pumps.**
**6 Hoist pump repair kits.**
**6 Complete oil lines.**
**1 Hoist piston complete.**
**3 Hoist piston rods, rings, head, studs, and gaskets.**
**4 Sets hoist arms, rockers, tracks and rollers.**

**MISCELLANEOUS**

**4 Windshield wiper motors.**
**20 Windshield wiper blades.**
**5 Sets headlights.**
**25 Headlight lenses and cork gaskets.**
**50 Headlight bulbs.**
**10 Headlight reflectors.**
**4 Sets headlight wiring.**
**20 Complete Tail lights.**
**10 Sets windshield glass.**
**25 Tail light bulbs.**
**4 Sets Tail light wiring.**
**10 Sets door glass.**
**10 Sets door latch, lock and handle.**
**10 Sets window regulators complete.**
**3 Batteries.**
**6 Sets battery cable.**
**6 Starter buttons, solenoids, switches and cables.**
**20 Rear springs.**
**10 Helper springs.**
**20 Front springs.**
**6 Rear spring shackles.**
**6 Front spring shackles.**
**4 Sets tail gate brackets and pins.**
**3 Sets body hinges.**
**50 Tailgate hooks.**
**10 Tires.**
**20 Tubes.**
**1 Front Wheel.**
**1 Rear Wheel.**
**15 Sets wheel lugs and nuts.**
**3 Sets wheel rims.**

# Field Notes

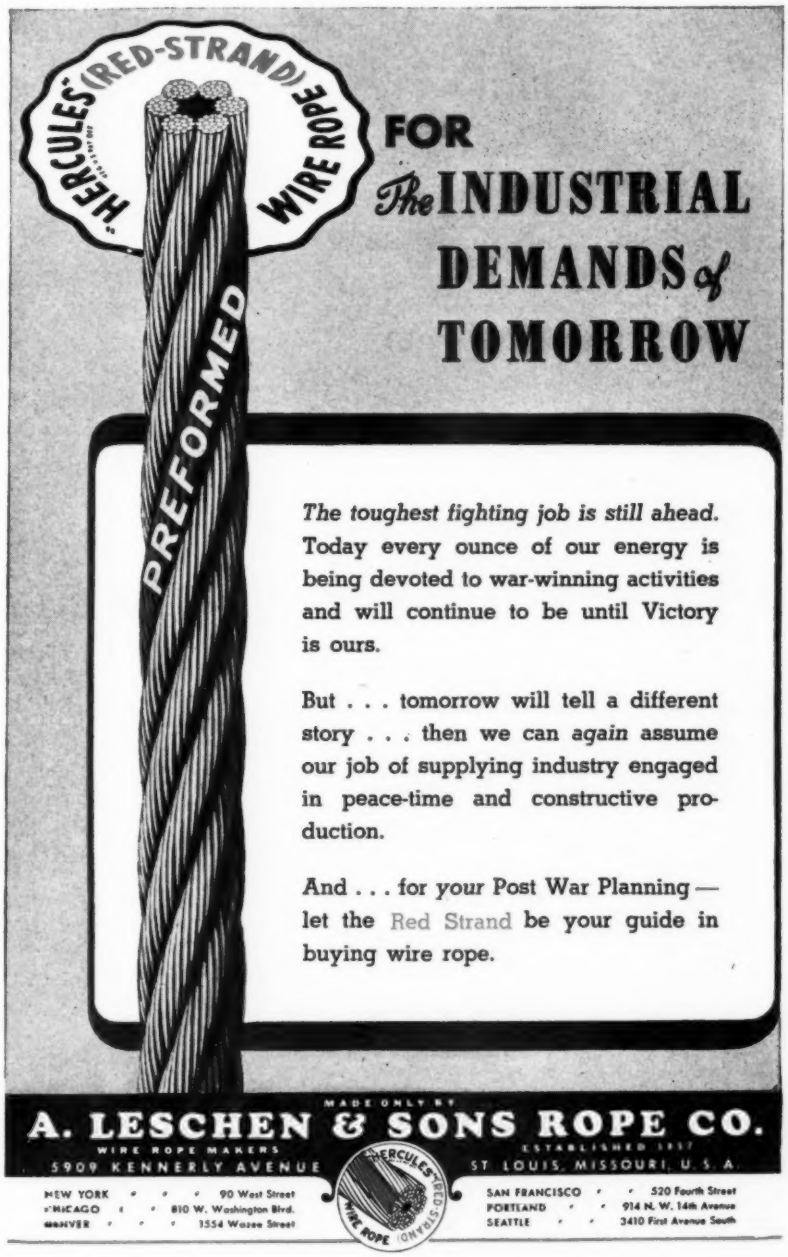
*(Continued from page 144)*

must frequently be cleaned during use around a power shovel. Remove the rubber covering from the blade-like part of the scraper and sharpen the lower edge of the metal webb or frame around which the rubber was poured. Put a small screweye in the end of the handle and attach a common key ring chain. The button eye, or ring, can be placed under one of the side buttons of the overalls and thus the cleaner can be kept quite conveniently, ready for use, in the rule pocket. The chain prevents the accidental loss of the scraper and is long enough to allow use of this handy tool without detaching it. Wooden paddles, commonly used for cleaning shovels and other hand tools, do not last long and are often misplaced. This little homemade gadget will last indefinitely.

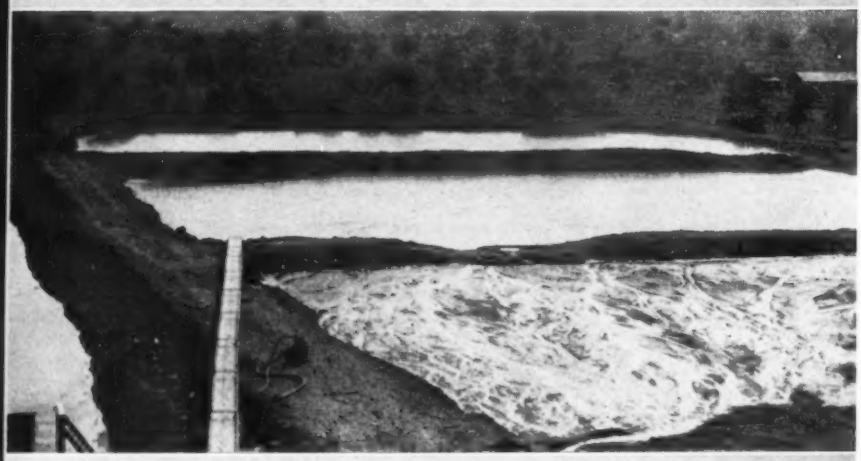
## Memo Holder For Truck Steering Wheel

To make a novel, but practical, memo holder for the steering wheel of a truck, illustrated in the picture, cut a fairly large thread spool in two. Make a nick in each end close to the bottom on both sides of the spool. Wrap a rubber band around one end of the spool, under the steering wheel spoke, and then around the other end of the spool. To use, simply raise the spool a trifle and slip the note between the spool and the steering wheel spoke.

● **This half-spool attached to the spoke of a steering wheel with a rubber band makes a good memo holder.**



HERCULES (RED-STRAND) WIRE ROPE
PREFORMED
FOR The INDUSTRIAL DEMANDS of TOMORROW
The toughest fighting job is still ahead. Today every ounce of our energy is being devoted to war-winning activities and will continue to be until Victory is ours.
But . . . tomorrow will tell a different story . . . then we can again assume our job of supplying industry engaged in peace-time and constructive production.
And . . . for your Post War Planning — let the Red Strand be your guide in buying wire rope.
MADE ONLY BY
A. LESCHEN & SONS ROPE CO.
WIRE ROPE MAKERS
ESTABLISHED 1857
5909 KENNERLY AVENUE
ST. LOUIS, MISSOURI, U. S. A.
NEW YORK 90 West Street
CHICAGO 810 W. Washington Blvd.
DENVER 1554 Wazee Street
SAN FRANCISCO 520 Fourth Street
PORTLAND 914 N. W. 14th Avenue
SEATTLE 3410 First Avenue South

● Ore washing plant. In the right foreground is the stacker pile which is bulldozed away for future re-treatment and in the right background is the discharge chute from the settling tank which carries the water and sludge to a settling pond. In the upper left a truck can be seen dumping ore-dirt into the hopper.



● Sludge settling and water storage ponds. The pond in the foreground is full of sludge and the chute has been moved to discharge into the next pond. Water from which the sludge has settled flows into the second pond; in the background, from where it enters the open ditch to the left.

● Another view of the washer plant with the open ditch for returning the water from the two settling ponds. About 100 feet from a Gould electrically-powered centrifugal pump the water enters two eight-inch pipes. Material on the left is from the stacker.

● Left: The finished product, lead and zinc ore concentrate, is loaded into trucks and hauled to the smelting plant. Ore concentrate pictured is galena, or lead sulphide. Right: Bucyrus-Erie ⅓-cu. yd. shovel loading truck through ramp with concentrates from the cleaner jig and coarse concentrates from the rougher jig bed that had been shoveled into an ore bin outside the preparation plant. This concentrate is sold to a smelter.

# Sucker Flats

*(Continued from page 117)*

at Sucker Flats. After the richer ore bodies were reached the daily average included 2,000 tons of ore. It is estimated that there are 4,300 pounds of ore to one cubic yard around the 85-foot level. About 200,000 cubic yards of overburden were moved before any ore dirt of reasonable richness was obtained. The daily output of the draglines varied greatly because of the differences in type of material being excavated and the number of moves involved on various days. The Bucyrus-Monighans have been walked down maximum grades of 33 per cent, although the regular practice is to prepare walkways at 20 per cent grades. One of the machines was changed to the Ward-Leonard system of electrical control and because of the smoothness and braking characteristics of this control it was found that it could be walked down the steep grades encountered with greater ease. Plans have been made to put Ward-Leonard control on the second dragline in order to take advantage of this factor. A change in vertical elevation of 100 feet is frequently made by the walking draglines in from 20 to 30 minutes at Sucker Flats. One of the bulldozers is kept in the pit for making roadways between and on the bench levels so that the draglines can be walked to various levels to follow the general stair-step plan of stripping.

Electrical power to run the draglines is brought in at 11,000 volts to a sub-station located at the northeast end of the property where it is stepped down to 2,300 volts to power the Bucyrus-Monighans. Power for lights for night operations is furnished at 110 volts by transformers.

Water encountered in the open pit is accumulated through natural drainage to a small area near the drift cut by Evans through the limestone ledge 115 feet below the surface. This water is pumped up an eight-inch pipe through Evan's shaft by an electric powered eight-inch Pomona turbine pump installed at the upper end of Evan's shaft on the limestone bank just west of the pit. This pit water is piped to the storage pond for use in the washer plant about one-fourth mile west of the open pit. The storage pond is adjacent to the preparation plant on the west.

### Carrying Ore-dirt to Plant

From the stock piles of mixed ore and overburden carried out from the pit ore formations by the draglines, ore-dirt is loaded to three Interna-

# 9 Items to Check When Ordering Wire Rope

(Note: Every day, several orders are received which require correspondence and delay because of insufficient information.

Listed below are items which can be used as a wire rope specification check list. Because wire rope is a controlled material, CMP allocation or symbol, also certification, must be included before orders can be entered.)

**WIRE ROPE CHECK LIST**

| *Item* | *Example* |
|---|---|
| 1. Length | 120 Feet |
| 2. Diameter | ¾ Inch |
| 3. Number of Strands | 6 |
| 4. Number of Wires per Strand | 19 |
| 5. Lay | Right Lang Lay |
| 6. Core | IWRC |
| 7. Kind of Fabrication | PREformed |
| 8. Grade | (Improved Plow Steel) Monarch Whyte Strand |
| 9. Use . . Make, Model of Equipment | |

*(Plus . . . CMP allocation or symbol, also certification.)*

Here are all these items for this order.

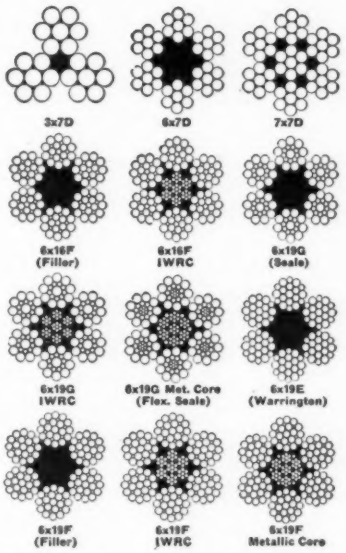
120 feet ¾-inch 6 x 19 Right Lang Lay with IWRC PREformed Monarch Whyte Strand Wire Rope, to be used for hoist line on Model 45 Lorain Skimmer.

*Note: For more complete detailed information on how to specify wire rope, refer to Macwhyte G-15 Wire Rope Catalog, pages 89 to 101.*

**The above check list is normal and complete as to the specifying of wire rope in peacetime, but it is more important than ever in wartime when it is so difficult to get wire rope.**

**STATE USE FOR ROPE—IT HELPS**

Always include the type of service for which the rope is wanted. Then if an error is made in listing the proper construction, or if our experience has shown a different construction gives better service for this purpose, we may be able to help you obtain a better rope. In some cases such information today, makes possible your getting a wire rope to meet your needs when the rope you specify is not available but a similar one is available that might do an even better job for you at no additional cost.




**These are but a few wire rope constructions taken from our G-15 Wire Rope Catalog to indicate the vast number of types and constructions of wire rope that are made. As wire rope manufacturers, we are in a position to help wire rope users obtain the correct rope for their specific needs.**

**HOW TO MAKE SURE OF CORRECT ROPE FOR YOUR EQUIPMENT**

There are hundreds of different sizes, grades, and constructions of wire rope. For many years we have cooperated with wire rope users to get the correct ropes for all kinds of equipment. We have watched these ropes give outstanding service on equipment like yours.

The benefit of that experience may help make your wire ropes last longer, or may help you in specifying what we believe is the finest wire rope you can buy — the *correct* rope for *your* equipment: Monarch Whyte Strand PREformed.

Monarch Whyte Strand PREformed has recorded outstanding service records because:

*It's made from selected steels.*

*It's PREformed to reduce internal stresses and to fight rope fatigue.*

*It's internally lubricated to protect wires and strands against corrosion and friction.*

**MACWHYTE**
**PREformed**
**WIRE ROPE**
***Plus* Internal Lubrication**
**Selected Steels**
**Tested—Proved**
*The correct rope for your equipment*

NO. 706

**MACWHYTE COMPANY**

ARMY E NAVY

**WIRE ROPE MANUFACTURERS**

*The correct rope for your equipment*

*2903 Fourteenth Avenue, Kenosha, Wisconsin*

*Mill Depots:* New York · Pittsburgh · Chicago · Fort Worth · Portland · Seattle · San Francisco. Distributors throughout the U.S.A.

MACWHYTE PREformed and Internally Lubricated Wire Rope · MONARCH WHYTE STRAND Wire Rope · MACWHYTE Special Traction Elevator Rope · MACWHYTE Braided Wire Rope Slings · MACWHYTE Aircraft Cables and Tie-Rods · MACWHYTE Stainless Steel Wire Rope · MACWHYTE Monel Metal Wire Rope

● The Red Arch dragline buckets are kept in condition for this exceptionally hard digging by building up teeth, riveted sections of side plates, heel plates and runner bars with Lincoln 3/16-inch Abrasoweld in the company's own repair shop. The above pictures show weld pattern on a bucket being built up.

tional trucks by a Bucyrus-Erie 10-B ⅜-cu. yd. gasoline shovel and hauled about a half mile to the preparation plant. Each truck carries a load of from 4½ to 5 tons to the plant every seven or eight minutes on three eight-hour shifts. The trucks are driven up a ramp with an elevation of 16 feet and dumped into a 12'x12" hopper. Ore-dirt stock piles are kept at an average of from 40 to 50 tons at all times. The preparation plant has a maximum capacity of handling 100 tons of ore-dirt an hour and is worked 24 hours a day on three eight-hour shifts.

The preparation plant, or mill, is unique in that it does not have crusher rolls, sludge tables, or flotation tables. The screen, hopper and stacker were formerly used on a gold placer dragline dredge made by the Bodinson Manufacturing Company of San Francisco, California. Cooley Brothers decided upon the use of this type of mill because of the dirt mixture and the sticky condition of the heavy soapstone and shale content of the ore-dirt, which could be crushed only with the greatest difficulty, and which the ordinary type of lead and zinc mill would not be able to handle. Another reason for using this type of mill was because much of the ore content of the material run through the mill is free in the deposit. A preponderance of the ore values occurs as free sphalerite and galena with a small percentage of non-sulphides, particularly in the oxided zone above the 105-foot level. Much of the mineralization in Sucker Flats occurs as deposits in the shrinkage cracks of the shale. Wherever broken flint is encountered, the ore occurs interstitially. Lead concentrate, or galena, and zinc concentrate, or jack, are lead and zinc sulphides respectively. Chemically, galena is 80 per cent lead and 20 per cent sulphur, and jack is 60 per cent zinc and 40 per cent sulphur.

### Preparation Plant

Initial designs for a washing plant to treat the ore dirt at Sucker Flats so closely resembled a washing plant used by Cooley Brothers in gold placer dredging that they shipped their placer gold washing plant, then stored in Montana, to Webb City.

After the material is dumped into the hopper by the trucks it enters a 20-foot long round abrasive-resisting steel trommel screen of five-foot diameter. Water is introduced into the screen. The first five feet of the screen adjacent to the hopper is a blank scrubber section, followed by 14 feet of perforated plate with perforations tapered from 9/16" on the inside of the screen roll to ⅝" perforations on the outside of the screen roll. The third section of the screen is two feet of ⅝" tapered perforations and the five-foot end section of the screen is also a blank. Two steel bars placed across the hopper end of the trommel screen control the flow of material through this screen.

The plus 9/16" material goes on to a 30" belt conveyor 60 feet long which carries it off the end of the stacker. The stacker pile is pushed off to one side by a bulldozer for future retreatment. The 9/16" material, along with about 1,000 gallons of water a minute goes to a Telsmith screw rewasher which de-waters the material. The de-watered material is carried to an 18" to 24" center bucket elevator which carries it to a four-cell steel plunger-type rougher jig (Cooley Type). Each of the cells is 48" x 54" and discharges the refuse to a de-watering cone and from there to a 30", 40-foot tailings elevator from where it is dumped outside of the mill. The hutch product, or smittum, goes to a 14" x 18" center bucket elevator which delivers it to a five-cell steel Cooley-type cleaning jig with 36" x 48" cells. Lead concentrates are recovered from the first cell and the product of the second cell is returned to the cleaner jig. Zinc concentrate is recovered from the fourth and fifth cells.

The overflow water from the screw washer (conveyor or feeder), the discharge from the cleaner jig, the overflow water from the cones at the end of the rougher jig and the sand jig, and all other overflow water goes to a drag-type settling tank and is returned to the settling pond for reuse. The settling tank is about 36 feet long with a settling length of 22 feet and washer discharge from both sides and the rear of the tank.

The material recovered from the settling tank goes to the same 14" x 18' bucket elevator that delivers the smittum to the cleaning jig and is carried to a sand jig identical in construction to the rougher jig. The overflow from the sand jig goes to the de-watering cone, the de-watered material to the tailings elevator, and the hutch product or smittum to the smittum elevator which discharges to the cleaner jig.

### Water for Washer Plant

Water for the washer plant is supplied at the rate of 2300 gallons per minute by an eight-inch Gould cen-

● Caterpillar D-8 tractor with LeTourneau bulldozer stripping a pocket of ore in the pit of the Sucker Flats mine. This ore-dirt will be brought to the surface by the dragline pair.

DRILL
in any position
and at any angle
with the
CLEVELAND
DR30
Pneumatic tires are now unobtainable except for armed forces; DR30 Wagon Drills are regularly supplied with steel wheels only.

★ By merely loosening two nuts, the Cleveland DR30 Wagon Drill can be swung forward or back and from side to side. Then set it as you wish—straight down, flat, breast high, higher than your head, within 4" of ground level, or even straight up. • Here are a few more important features of the DR30:

- ★ **Feed capacity over 8 feet, handles depths to over 25 feet.**
- ★ **Recoil device holds machine to its work, increases drilling speed 10-25%.**
- ★ **Forward leg point holds the drill and steel in line on all kinds of holes.**
- ★ **Centralizer keeps steel from "walking" when starting hole, prevents breakage of bit points.**
- ★ **Twin jack-screw mechanism permits easy moving of U-bar, shortens set-up time.**
- ★ **Main wheels swivel 90° for line drilling, and 180° to obtain narrower tread.**

*Write for Bulletin 132 that fully describes the most popular wagon drill ever built.*

**BRANCH OFFICES**

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| Birmingham, Ala. | Detroit, Mich. | Pittsburgh, Pa. |
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**CANADIAN DISTRIBUTORS**

Purves E. Ritchie & Son, Ltd., 658 Hornby Street, Vancouver, B. C.

***BUY U. S. WAR BONDS AND STAMPS***

## THE CLEVELAND ROCK DRILL COMPANY

*Division of The Cleveland Pneumatic Tool Company*

**CABLE ADDRESS: "ROCKDRILL" • CLEVELAND 5, OHIO.**

**LEADERS IN DRILLING EQUIPMENT**

● Repair shop (foreground) and office (extreme right) of Cooley Brothers at Sucker Flats in Webb City.

trifugal pump powered by a 40 h.p. G-E motor taking water from two settling ponds approximately 200′ x 150′ in size and from 10 to 20 feet deep. These ponds were constructed to the west of the washer plant by one of the draglines. There is an open ditch from the second pond to a point about 100 feet where the pump is placed. Two eight-inch pipes carry the water from the open ditch to the pump. The water supply comes from the eight-inch Pomona vertical pump with a 50 h.p. Fairbanks-Morse motor in the Evan's shaft near the open pit. The Pomona pump has a suction 120 feet deep and pumps 1,000 to 1,200 gallons per minute from the pit into the settling ponds.

Concentrates from the cleaner jig and some coarse concentrates from the bed of the rougher jig are shoveled into an ore bin outside of the preparation plant from where it is sold to a smelter. The smelting plant does its own hauling and shipping. A small percentage of iron pyrites found in the final concentrates is being successfully handled by the smelter.

It's easier to lift, lower, push or pull the Simplex Way!
Simplex
LEVER · SCREW · HYDRAULIC
Jacks
for every construction purpose
Awarded the Gold Medal for Safety
Ask for Catalog 44
Templeton, Kenly & Co., Chicago 44, Ill.


At the present time Cooley Brothers are contemplating a plan for retreating the plus 9/16″ material now rejected by the belt stacker.

The whole operation at Sucker Flats could be called a placer-type lead and zinc mining operation and differs from the usual method of mining lead and zinc in the Tri-State field in about the same ways that gold placer mining differs from hard rock gold mining. Most of the Sucker Flats material can be dug with a dragline without shooting, the same as in placer gold mining. All other mining in the Tri-State Field requires drilling and shooting, the same methods used in underground gold mining operations.

The Cooley Brothers report that recovery of ore at their plant has been quite satisfactory to date in spite of the skepticism shown by veterans of the Tri-State Field in the beginning of the Cooley Brothers operations at Sucker Flats. With underground mining methods usually used in the Tri-State area the minimum ore content of the dirt must be four per cent to make an operation successful. At Sucker Flats the minimum ore content of the dirt can be as low as two per cent and still make the operation economically feasible.

The top 50 to 80 feet of the open pit area have the lowest ore content value and can, for all practical purposes, be considered overburden even though a considerable percentage of this can be selected and successfully run through the mill.

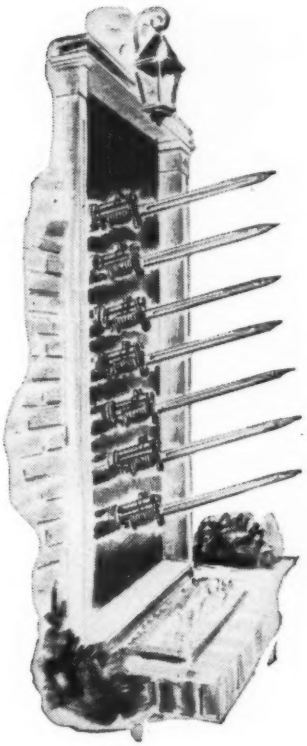
### Personnel of Cooley Brothers

Carl K. Carmean, veteran Tri-State mining engineer for the Federal Mining and Smelting Company for 25 years, became associated with Cooley Brothers on August 1st as mining engineer in charge of the construction and operation of the ore washing plant and the development of the ore body at Sucker Flats. Carmean had worked in the Federated Malay States in the Far East where he conducted preliminary experimental work with the Cooley-type jig on tin ore dressing dredges. Later, these jigs came into universal use for tin ore dressing.

C. G. Cooley and L. M. Cooley are the owners of Cooley Brothers. C. G. Cooley takes charge of the offices and L. M. Cooley manages the field operations. Carmean is engineer; V. C. Wright is superintendent; Allan Ross, afternoon foreman, and Ray Dowell, night foreman. Dragline operators are Jack Bolding, Ira Wybrow, Paul Van Meter, Clarence Murray, Reinhart Reiber, and Albert Arnett.

● One of the old hand jigs still in use in the Tri-State area for separating ore concentrate. The up and down jig motion originates by a man standing on a springboard, holding the end of a long wooden beam in his hands, and springing up and down. In the early days of Sucker Flats, this was the method of jigging used by the lessee miners.

# The fight on the doorstep



THIS WAR can't be won on battlefields alone. One of the most critical campaigns of all must be waged right on the doorstep of every family in America.

This is the fight against higher prices and higher wages. It's a fight that *must* be won... or victories on battlefields will be meaningless.

It's like this. In America this year, our total income after taxes will be about 133 billion dollars. But there'll be only about 93 billion dollars' worth of goods to spend it on. If we all start trying to buy as much as we can, prices will shoot up.

As prices rise, people will ask for—and, in many cases, get—higher wages. That will put up the cost of manufacturing, so up will go prices again. Then we'll need another pay raise. If we get it, prices rise again. It's a vicious circle.

The Government has done a lot to help keep prices down. It has put ceilings on food and rent... has rationed scarce articles. But the Government can't do it all alone.

It needs *your help!*

Your part in this fight won't be easy. It will mean foregoing luxuries, perhaps doing without a few necessities. Tough? Maybe... but don't say that where the veterans of Italy and New Britain can hear you!

You *want* to do your part, of course. So do we all... farmers, laborers, white-collar workers, business executives. And the way to do your part *right* now is to observe the following seven rules for Victory and a prosperous peace...

**1. Buy only what you NEED.** And before you buy anything, remember that patriotic little jingle: "Use it up. Wear it out. Make it do or do without."

**2. Keep your OWN prices DOWN!** If you sell goods, or your own time and labor, *don't ask for more money* than you absolutely must! No matter who tries to talk you into asking more... *don't listen!*

**3. No matter how badly you need something**... *never pay more than the posted ceiling price!* Don't buy rationed goods without giving up the required coupons. If you do, you're helping the Black Market gang—hurting yourself!

**4. Pay your taxes cheerfully!** Taxes are the cheapest way to pay for a war! The MORE taxes you pay now—when you have some extra money—the LESS taxes you'll pay later on!

**5. Pay off old debts.** Don't make any new ones! Get, *and stay,* square with the world!

**6. Start a savings account.** Make regular deposits, often! Buy life insurance. Keep your premiums paid up.

**7. Buy War Bonds... regularly and often!** *And hold on to them!* Don't just buy them with spare cash you can easily do without. Invest every dime and dollar you don't actually NEED... even if it *hurts* to give those dimes and dollars up!

**Use it up... Wear it out.**
**Make it do... Or do without.**

A United States War message prepared by the War Advertising Council; approved by the Office of War Information; and contributed by the Magazine Publishers of America.

# NOT in the *Contract*

A pair of newlyweds had tipped the porter generously on boarding the train to keep that fact a secret. The next morning, noticing the many knowing looks cast in their direction, the angry groom called the porter to account for his treachery.

"Lawdy, boss," he replied, "I didn't tell 'em; they asked me if you was jus' married and I sez 'no, they is jus' very good friends'."

The young lady walked boldly up to a woman whom she took to be the matron of the hospital. She asked: "May I see Lt. Barker, please?"

"May I inquire who you are?"

"Certainly. I'm his sister."

"Well, I'm glad to meet you," the lady replied, "I'm Lt. Barker's mother."

Tramp: "Has the doctor any old pants he could let me have?"

Lady: "No, they wouldn't fit you."

Tramp: "Are you sure?"

Lady: "Quite sure. I'm the doctor."

Two babies were in adjacent beds in the hospital and one said to the other, "I'm a girl—what are you?"

"I'm a boy."

"But you look like a girl," she countered.

"Wait until the nurse leaves and I'll show you."

When they were alone he shyly lifted the covers and said, "See the blue booties."

The stingiest man we ever heard of bought his bride a nickel's worth of peppermint lozenges and took her on a trolley-ride honeymoon. When they got off the car he said, "Honey, suppose we save the rest of this candy for the children."

A recession is a period in which you tighten up your belt.

A depression is a time in which you have no belt to tighten.

When you have no pants to hold up, it's a panic.

"Gosh! But it's sticky today!"

Perplexed Oriental: "Our children velly white. Is velly strange."

Spouse: "Well. . . . Occidents will happen."

With all the girls in defense plants it's hard to get a date. They don't want to go out for a time any more. They want time and a half.

"Is 'trousers' singular or plural, Johnnie?"

"Singular at the top and plural at the bottom."

The British barmaid was a flirt, and when the corporal went out to buy a paper she pursed her lips invitingly and leaned over the bar toward the shy young private.

Putting her face against his, she whispered: "Now's your chance, darling."

The private looked around the empty room.

"So it is," he remarked, and promptly drank the corporal's beer.

The newly-weds had just got off their train.

"John, dear," said the bride. "Let's try to make the people think we've been married a long time.

"All right, honey," was the answer, "you carry the suitcase."

Hunter: "How do you detect an elephant?"

"You smell a faint odor of peanuts on his breath."

Customer: "Your dog seems very fond of watching you cut hair."

Barber: "It ain't that; sometimes I snip off a bit of a customer's ear."

Hubby: "Darling, haven't I always given you my salary check on the first of every month?"

Wife: "Yes, but you never told me you get paid twice a month, you embezzler."

Coming home late one night, man of the house found the following message, in the handwriting of his Polish maid, fastened to the telephone.

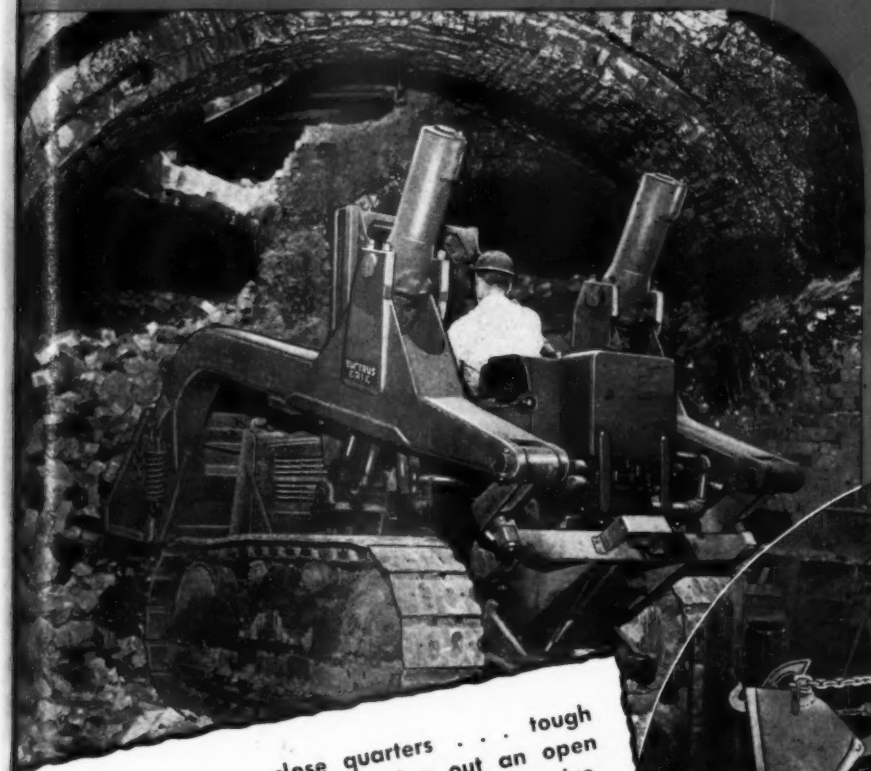
Mz Nx Kuldop
Zo Zum Ykam Kulrop
Nemera Owlete Tzgonabe
Kulrope

He lay awake half the night wondering what the mysterious message could mean. In the morning the maid explained,

"Mrs. Nix called up. So soon you come, call her up. No matter how late it's gonna be, call her up."

# The Bucyrus-Erie DOZERSHOVEL

# GETS IN...AND DIGS!



There's plenty of room all around as this Dozershovel moves into the low, narrow archway to pick up a big load of bricks . . .

. . . it carries the load to the spoil pile, dumps, then returns to repeat the operation —in a profitable hurry.

Low clearance . . . close quarters . . . tough digging . . . The job of cleaning out an open hearth furnace was painfully slow and expensive, for it had to be done by hand — until a Bucyrus-Erie Dozershovel went to work on it. Then things were different, because the Dozershovel's low over-all height allowed it to move right in under the arch, its powerful digging action let it take big bucket loads, its maneuverability permitted easy going from furnace to spoil pile. This important war job could now be done fast, economically, profitably.

This is just one of the many unusual jobs, hitherto done by hand, that the versatile Dozershovel handles efficiently. In addition to the unit's use as a shovel, a quickly interchangeable dozer blade permits full-fledged dozer service, and a hook on bucket or blade provides for utility crane application. Get the complete story of this new unit for T9 and TD9 International TracTracTors from your International distributor.

N-69C

**BACK THE ATTACK!**

BUY WAR BONDS

BUCYRUS ERIE TRACTOR EQUIPMENT

SEE YOUR

**INTERNATIONAL TRACTRACTOR DISTRIBUTOR**

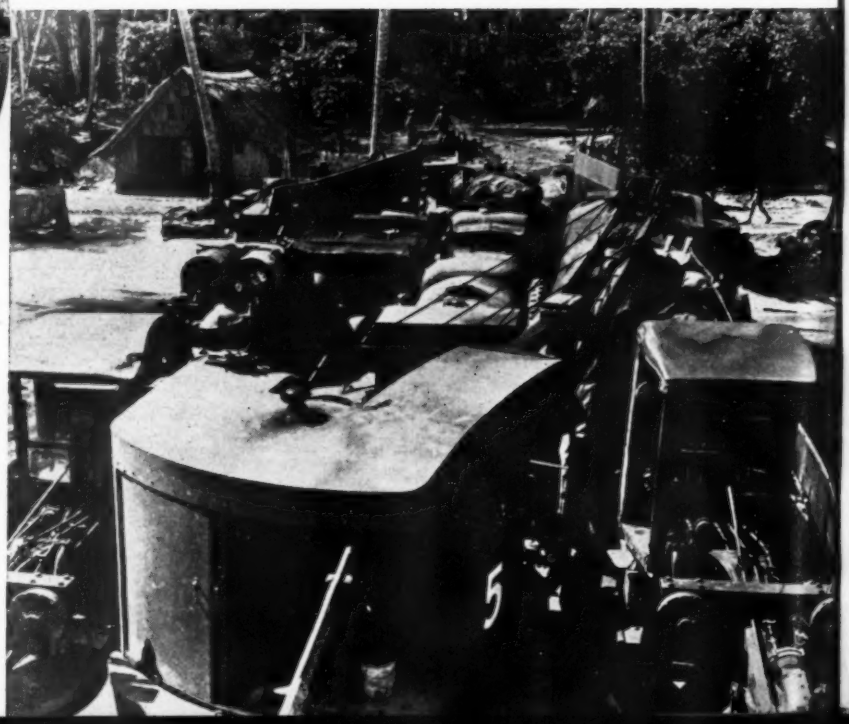
## Seabees . . .

*(Continued from page 121)*

mobile and advance, are the foundation of our armed striking power. In accepting the responsibility to provide these bases to support and maintain Navy forces on the surface, under the surface and in the air, the Seabees are tackling a large-sized job.

However, reports returning from battlefronts and potential battlefronts all over the world indicate that it is a job that will be well done. These fighting construction men are full of the spirit that engenders proud traditions, and when the final chapter of this war has been written, the Seabees will be able to point with justifiable pride to their accomplishments.

**● Above, right: Many peaceful South Pacific islands have been visited by new and strange things. The sudden advent of roaring machines that gouged roads out of their tropical hills was probably as exciting to the natives as shovels or bulldozers are to American "sidewalk superintendents." Right: These cranes are used to sort, carry and pile lumber in a yard set up by the Seabees in Attu soon after they had assisted in bayonetting reluctant Japs out of their ditches in this northern outpost.**



**● Above: A LeRoi pump diverts the water from this stream on Attu and forces it along to the camp to supply the whole U. S. encampment on the island. The dragline is being used to widen and deepen the stream. Right: A barge loaded with fuel trucks, jeeps, road-graders and a power shovel touches newly gained ground. Manned by the Seabees, these machines will build operational facilities from which another allied offensive can be sprung.**

# *Congratulations*

## ON A FINE JOB, WELL DONE!

THE Treasury "Star" Flag—the bond-buying counterpart of the Army-Navy "E"—marks plants with at least 90% of personnel participating in the Payroll Savings Plan to at least 10% of gross payroll, *and also having reached, or topped, a War Loan Drive quota!*

The successful close of the 4th War Loan Drive finds many more "Star" Flags than ever before flying over the industrial plants of America. To all these, go the heartiest thanks of the nation, and the deep appreciation of the Treasury Department for a great job! And to those who may not quite have qualified for the "Star," go equally sincere thanks—and the confidence that soon they, too, will join the ranks of the "Star" fliers.

One thought that many concerns have found helpful in stepping up the intake from their Payroll Savings Plans is this. In many cases the Treasury Representative in a plant has been able to point out the fact that during *Loan Drive periods* the employees have found it possible to spare much more than they had counted on when setting up their original subscription, and that—*when properly approached*—a very substantial fraction of such employees will decide they can well afford a distinct increase in their current Payroll Savings Plan.

Talk this over with your Treasury Representative—it offers important possibilities when correctly handled. And again accept the Treasury Department's congratulations for your fine work in helping to put over the 4th War Loan.

*LET'S* **ALL** *KEEP BACKING THE ATTACK WITH* **WAR BONDS**

*The Treasury Department acknowledges with appreciation the publication of this message by*

Excavating Engineer

*This is an official U. S. Treasury advertisement—prepared under auspices of Treasury Department and War Advertising Council.*

ERIE THE COMPLETE LINE BUCKETS

Hundreds of Erie Buckets are being shipped monthly for war uses. Straight line bucket production experience means better buckets for post-war and fast delivery. Investigate the complete Erie line now.

ERIE STEEL CONSTRUCTION CO • ERIE, PA.
AggreMeters • Buckets • Concrete Plants • Traveling Cranes

## WALTER ALEXANDER ROGERS

*(Continued from page 142)*

and daughter. He took a great interest in community life and was an active supporter of the Glen Ellyn Congregational church, the YMCA and kindred activities. For many years he was chairman of the board of George Williams College of Chicago.

Mr. and Mrs. Rogers were the parents of five sons and a daughter, all but one of whom, with their mother, survive Mr. Rogers. His children are Lester C., president of the Bates & Rogers Construction Corporation, Margaret G., Ross W. (deceased), Dr. Carl R., professor of applied psychology at Ohio State University, Dr. Walter C. of Pasadena, California, and John W., who is also associated with his father's corporation.

Mr. Rogers was elected a junior member of the American Society of Civil Engineers in 1891, an associate member in 1897, and a member in 1900. Perhaps Walter Alexander Rogers will be best remembered for his kindly tolerant spirit, his quiet perseverance in what he believed was right, and his willingness to lend a helping hand.

**LINN HAFTRAKS** show their mettle
from the Equator to the Arctic Circle

•

THE LINN MANUFACTURING CORPORATION
MORRIS • NEW YORK

## S. J. Weis
### 1883-1944

Samuel J. Weis, 61, assistant vice-president of Bucyrus-Erie Company and formerly Far Eastern representative of this company, died suddenly of a heart attack on January 25.

Mr. Weis was born in Cincinnati,

Ohio, and attended Purdue University engineering school. He became associated with the Bucyrus Company in 1904 and after two years he joined the Yuba Construction Co. where he remained for a number of years before going to the Gold Coast of Africa to manage a dredge property. From Africa Mr. Weis went to London where he was employed by Frazer and Chalmers in designing dredges and doing consulting engineering work. While in London he met and married Ruth Stephenson. Later Mr. Weis was retained by the Lenskoie (Lena Gold Mining Co.) to purchase a dredge for a large mining property in Russia. The dredge was purchased from Bucyrus-Erie Company in 1917. In June, 1918, he rejoined Bucyrus-Erie Company and was made manager for China and Japan. For over 20 years he spent most of his time in foreign countries for Bucyrus-Erie Company.

He concluded his extensive traveling abroad about four years ago and had since made his headquarters at South Milwaukee, Wisconsin.

Mr. Weis was highly entertaining and quick-witted. During his years of service Mr. Weis made many friends for himself and his company, both at home and abroad and contributed a great deal to the success of Bucyrus-Erie in foreign fields.

In addition to his widow, Mr. Weis is survived by two sons, John and Captain Peter E. Weis who is stationed at Panama City, Florida, and a brother, Edward Weis of Chicago.

**TO ADVERTISE:** All advertising in this section is payable in advance. Rate: 60c per line, or $7.20 per inch of 12 lines. Minimum charge $2.40. No discounts; no commissions. If no change in copy is desired, three continuous insertions are offered for the price of two. Read these instructions carefully. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Count your own copy to save delay. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January issue closes December 15th.

**TO INQUIRE:** Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

**FOR SALE OR RENT**

½ yd. Bucyrus Crane—Clamshell—Dragline
1 yd. Northwest Crane—Clamshell—Dragline
1½ yd. Marion Shovel—Diesel
2½ yd. Bucyrus Dragline—Diesel
1,000,000 Ton Strip Coal Mine in Illinois.
**A. W. Nevers, Mt. Pleasant, Ia., Phone 32**

1¼ yd. Koehring No. 2 crane shovel dragline Diesel 50 bulldozer. Shovel attachment only for P&H Model 204. Box 3021

Rebuilt and guaranteed Bucyrus-Erie 46-B 2-yd. dragline and crane, 60′ boom, long and wide mounting. Located Chicago. Box 3019

One Lima ¾ yd. Model 302 shovel, powered by Caterpillar Diesel Engine—overhauled—located near Hibbing, Minn.
**Wm. H. Ziegler Co., Inc., Duluth, Minn.**

***Electrically Operated***

**175-B Ward-Leonard electric shovel with 65′ boom, 42′ handle. Can handle 4 or 5 yard dipper for stripping or 7 yard dipper if used for coal loading. Operated one-third of time loading coal since shipment. Excellent condition. Can be demonstrated. Reasonably priced. Ready for immediate delivery. Box 3013**

Caterpillar Steam Crane, equipped with dragline and 50 ft. boom which will handle a 3 yd. bucket. This machine in good repair, can be seen in our yard. Weighs 45 ton. Box 3016

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**Two 2-yard, 1938 Jaeger Truck Mixers, mounted on 1938 Ford V-8 chassis. Both mixers and trucks are in A-1 condition.**
**Thomas DeFalco**
**14 May St. Worcester, Mass.**

**FOR SALE**

1—1¼ yd. Model 5 combination shovel-dragline, complete with 45′ crane boom and shovel attachment, with full Manganese bucket—rebuilt and guaranteed .....$16,100
1—1-yd. Model 4 Northwest shovel-crane-dragline combination, with brand new washer-type connecting 45′ boom. Wisconsin gasoline engine. Rebuilt and guaranteed .....$14,229
1—½ yd. Speeder Shovel, Model B-3, 6 cylinder Hercules gasoline engine, approx. weight. 30,000 lbs. Has been cleaned, painted and repaired .....$4,950
1—Model 301 Koehring shovel with extra wide crawler pads, 1-yd. dipper, powered by Wisconsin B-2 gas engine .....$7,780
1—36″x20″ Wisconsin Foundry Roll Crusher, used only two months after installation of new Star Gears and bearings. Includes one brand new $500 set of smooth rolls. Selling price .....$2,000
1—RD-6 Caterpillar Tractor with LeTourneau Angledozer ..... price on application
1—RD-7 Caterpillar Tractor with LeTourneau Angledozer ..... price on application
**HUNTER TRACTOR & MACHINERY CO.**
**327 South 16th St. Milwaukee 3, Wis.**

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**Shovel attachment complete for Bucyrus-Erie 37-B 1½ yd. machine. Excellent condition. Dipper just equipped with new Amsco dipper body. Contact Brandeis Machinery & Supply Co., Brook & Warnock Sts., Louisville, Ky.**

**50-B BUCYRUS-ERIE SHOVEL PARTS**

Steel boom, set dipper sticks, 40 H.P. crowd motor, 40 H.P. swing motor, 100 H.P. hoist motor. Located Northern Ohio District. Motors are for 440 volt, 3 phase, 60 cycle current. Box 3018

10-B Erie Skeleton Trailer. Serial No. 150. Very good condition. Price $500. Box 3017

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100—batch boxes with cement compartment.
6-8 ton locomotives gasoline 24 gauge Plymouths and Whitcombs.
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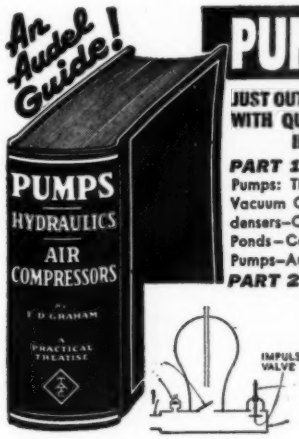


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# *Notes* from the manufacturers

**The Cleveland Tractor Company**, Cleveland, 17, Ohio, announces that Leslie H. Hughes has been appointed advertising manager. Mr. Hughes has been advertising manager of the Brown Fence & Wire Company in Cleveland since 1939.

W. E. Mills, industrial sales manager of the Cleveland Tractor Company was awarded Cletrac's 25-year service pin by Henry J. Leisenheimer, vice-president and export manager, at an informal ceremony recently.

**Worthington Pump and Machinery Corporation**, Harrison, New Jersey, announces the appointment of William O. Wilson of Evanston, Ill., as a commercial vice-president. Mr. Wilson will be responsible for general supervision and direction of all Worthington's commercial activities in the Chicago, St. Louis, Kansas City, and St. Paul district office territories.

**Chicago Pneumatic Tool Co.**, 6 East 44th Street, New York, 17, New York, announces the appointment of George B. Donner as sales manager of the Rock Drill Division. Mr. Donner was branch manager at Timmins and Kirkland Lake for the Canadian Pneumatic Tool Company of Montreal, Canada, a subsidiary company, for the past 19 years.

**International Harvester Company**, 180 North Michigan Ave., Chicago, Ill., announces the promotion of H. T. Reishus to the position of assistant domestic sales manager in charge of industrial equipment.

**Hercules Power Company**, Wilmington, Delaware, has issued its 1943 annual report showing net sales and operating revenues reached a new high of $122,518,626, compared with $114,378,235 in 1942.

**B. F. Goodrich Company** announces that the Industrial Products Sales division has been granted the national distribution rights of the Punch-Lok hose clamp and method of applying it to hose of all types, electric cable, and wire or textile rope. The Punch-Lok hose clamp is a mechanical device used to connect various kinds of male and female fittings, special nipples, menders, or ordinary pipe to a hose.

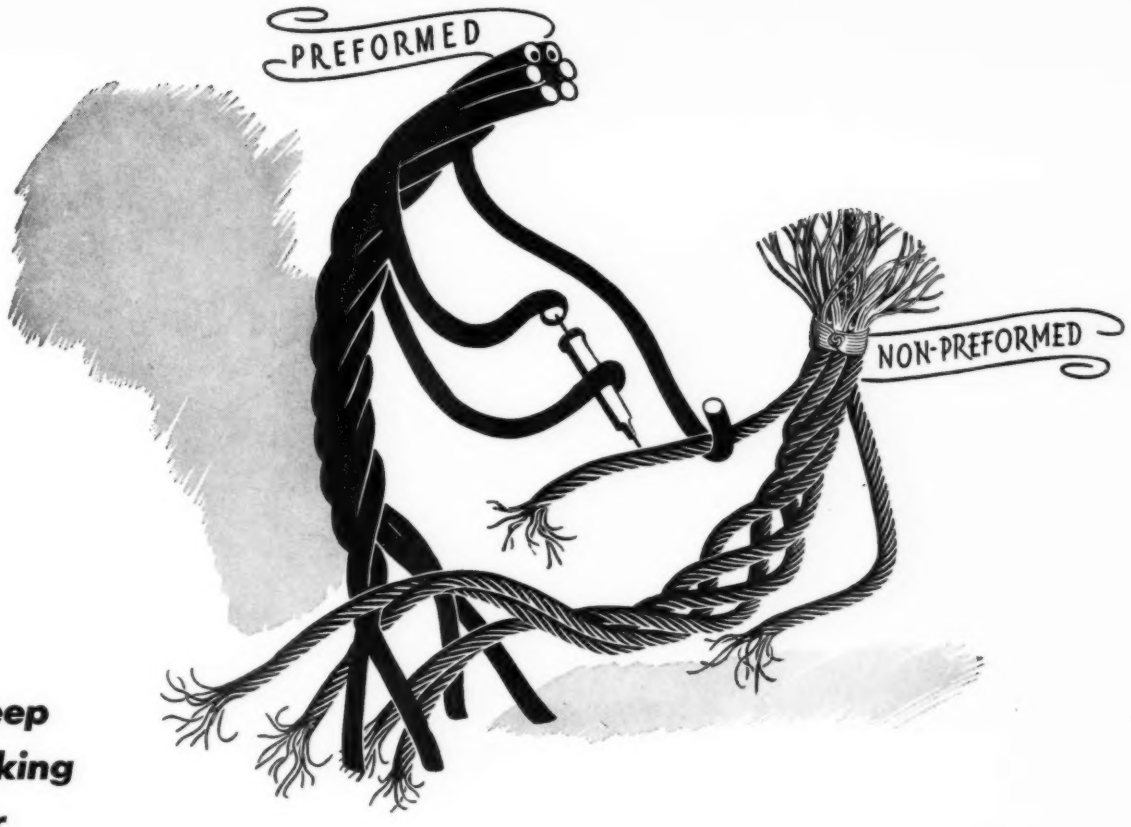
# *New* trade literature

Title: **"Postwar Highway Planning"**
Subject: Eighteen-page book catalogue containing list of selected pamphlets, books and articles of value to civic leaders, city and state officials interested in highway planning problems. Metropolitan and rural problems are covered.
Where to Get: Automotive Safety Foundation, 321 Tower Building, Washington, 5, D. C. (Free)

Title: **"Wire Rope Conservation"**
Subject: A 22-page illustrated bulletin on the conservation of wire rope. Among the subjects treated are: corrosion, how sheave materials affect wire rope service, lengthening wire rope life, importance of an adequate safety factor, regular inspection, protection against corrosion and nine important factors that affect wire rope life.
Where to Get: Request pamphlet No. 43-85 on company letterhead to Macwhyte Company, Kenosha, Wis. (Free)

Title: **"Wartime Condensed Catalog of Bulldozer and Gradebuilder"**
Subject: The Baker Manufacturing Company's Condensed Catalog 839 shows its line of hydraulic bulldozers and gradebuilders as standardized on a wartime basis. Baker hydraulic bulldozers, prior to the war, were available with two types of moldboards for each model of tractor—a boxed-end moldboard for excavating work, and the regular high moldboard type for levelling, spreading, piling, backfilling and other earth-moving jobs. These two types have been combined in a single moldboard, giving a broader range of application to one unit. Baker gradebuilders for crawler tractors are available in essentially the same models as in the past.
Where to Get: The Baker Manufacturing Company, Springfield, Illinois. (Free)

Title: **"Wartime Care of Chain Belt Drives"**
Subject: This 20-page booklet imparts information on maintenance, lubrication and repair of chain belt drives during wartime. Profusely illustrated with charts, the booklet instructs users on how to get the most out of their existing drives, and save costly delays and expense.
Where to Get: Chain Belt Company, 1600 West Bruce Street, Milwaukee, Wisconsin. (Free)

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